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New Legislation and Official Literature Issued During 1980

A. C. BUSHNELL

County Laboratory, County Hall, Preston PR1 8XN

Lists are given of some of the documents of 1980 relating to legislation likely to be encountered in Public Analysts' Laboratories; although far from exhaustive reference is also made to other literature which may be relevant to Public Analysts, serving as a reminder of how wide-ranging the Analysts' interest in official literature must now be.

An important omission from the APA list of new standards, etc., prepared from the documentation of 1979, was the EEC Directive (79/869/EEC), concerned with the quality of Surface Water for drinking. The Directive is one whose publication is not obligatory, but it was published in *The Official Journal of the European Communities* for 29 October 1979. It makes reference to Directive (75/440/EEC) of 16 June 1975 (published at O.J. No. L 194/26–25 vii 75) where a table listing 46 purity parameters gives 20 immediately applicable mandatory limits according to whether the abstracted water has been subjected to simple filtration, normal treatments involving coagulation, etc., or intensive chemical treatment involving breakpoint chlorination, treatment with activated carbon and perhaps ozone treatment, etc. The Directive (79/869/EEC) contains an Annex tabulating detection limits, precision, accuracy and the method of measurement for all but seven of the 46 parameters and another Annex specifies minimum frequencies of sampling for the three categories of water, according to the size of populations expected to consume them.

If one also takes account of criteria in Directive EEC/76/160, which relates to the quality of bathing water, and EEC/76/464 which deals with pollutants, and to proposals about dumping wastes at sea, and further water standards which will take account of the requirements of freshwater fish, shellfish and the conservation of groundwater, there are 65 analytical and microbiological criteria to be included in future Water Analyses (which is comparable with the number of tests which have been proposed for natural mineral waters—the latest Directive on that subject being Directive 80/777/EEC which appeared in O.J. No. L 229/1—30 viii 80).

In the same O.J. on p. 11, Directive 80/778/EEC deals with The Quality of Water for Human Consumption and ought to be implemented in the U.K. within 2 years.

There appeared still to be some uncertainty in 1980 about a possible standard for chloroform content in drinking water. In the present Directives it would

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be included in "Parameter 32—Dissolved or emulsified hydrocarbons", but among existing standards the Americans talk about a limit of 100 micrograms per litre and the Germans talk about only 25 micrograms per litre.

The second important item from 1979, which received only passing mention last year, has become known as the "Cassis de Dijon" case. Because the European Communities Act 1972 makes Britain, alone in the European Community, accept rulings of the European Court as binding upon U.K. courts, it was believed that the ruling given in Common Market Law Reports 1979, **26,** 494, might render all existing U.K. food standards invalid. In 1980 however, the MAFF dispelled some of the pessimism by letting it be known that in the opinion of the European Council for Legal Services there might be conflict in the judgments handed down in Cases 120/78, 788/79 and 148/78. Furthermore the European Court has supported the general principles of protecting the consumer and protecting Public Health. A harmonisation of food standards may, moreover, be implicit in the GATT Standards Code. It may still be too early to comment upon last years' prospect that the lowest common denominator in food standards was likely to become the norm against a probably insufficient safeguard of "informative labelling". "Cassis de Dijon" is a blackcurrant drink of relatively low alcoholic strength and which failed to meet National food standards of a country into which a Community importer wished to bring it. The European Court had ruled that national standards should not operate against free movement of Members States' goods within the European Community.

This article attempts, as in previous years, to provide a handy checklist for the year under review, but some rather more permanent reference material should also be noted thus:

A Comparative Directory of European Community Legislation as Enacted in the United Kingdom (plus a Supplement of legislation in the EEC pipeline). The document appears to update an earlier edition published in June 1979, and currently runs to 31 March 1980. Because it has no International Standard Book Number (ISBN), the Directory may best be obtained direct from the registered office of the Institute of Trading Standards Administration, Benfleet, SS7 2BW.

Consumer Protection and Information Policy (2nd Report 1979)—ISBN 92–825–1172–3 by the Commission of the European Communities, makes interesting supplementary reading with the above.

A Council of Europe Legal Affairs document number 62.620 05.2 (Strasbourg 1980), entitled: *The Collective Interests of Consumers—measures permitting agencies or associations to ensure the legal protection of the collective interests of consumers in member states of the Council of Europe*, lists all the agencies in the nine states that are concerned with consumer protection. The Association of Public Analysts is not mentioned even though public analysts may be one of the earliest overall consumer protection bodies of Europe.

British Business for 3 October 1980 (p. 207) and for 10 October 1980 (p. 258) provides another useful European legislation checklist which refers specifically

to Article 100 harmonisation. Parts of the food law entry are in each of the separate references.

Bell and O'Keefe's *Sale of Food and Drugs* has given way to a much more expensive publication called *Butterworth's Law of Food and Drugs*, which will now cost £150. Anybody hopefully awaiting an "Issue No. 9" to the "Noter up" and Service Volume will therefore need to consider increasing "Fees for analysis".

British Pharmacopoeia 1980

The new 13th edition of the *British Pharmacopoeia* (B.P.) became effective on 1 December, 1980 and is the first edition published wholly under the provisions of Section 99 (6) of the *Medicines Act* 1968. It includes over 250 monographs of the *European Pharmacopoeia*. Section 65 (7) of the *Medicines Act* 1968 gave precedence to monographs in the current edition of the *European Pharmacopoeia*. Many monographs that were formerly described in the B.P.C. 1973 and its 1976 Supplement have also been included; the B.P.C. entries will eventually be succeeded by those of the *European Pharmacopoeia* or the *British Pharmacopoeia*. The edition is published in two volumes, the first volume dealing with monographs and the second volume dealing with formulary, specialised topics and appendices.

One-hundred-and-four new monographs have been added, together with 290 new formulary items and 24 new general monographs on such items as applications, elixirs, linctures, etc. Fifty-one monographs and 79 formulary items have been deleted from this edition.

The new monographs include:

Anti-anginal.	*Prenylamine lactate.*
Antibiotic.	*Clindamycin hydrochloride.*
Antihistamine.	*Pheniramine maleate.*
Diuretic.	*Amiloride hydrochloride.*
Hypotensive.	*Clonidine hydrochloride.*

A dissolution test has been recommended for 18 preparations, and it is a measure of the proportion of the drug entering into solution under standardised conditions in a given time. Most preparations fall into category 1 which requires at least 70 per cent. dissolution in 45 minutes.

Increased use is made of the *Uniformity-of-Content* test which was first introduced into the 1978 addendum to the 1973 B.P. In it, 10 tablets are assayed individually, and normally each tablet may be expected to contain 85 to 115 per cent. of the mean content obtained in a general assay, (with the exception that one tablet is allowed to contain 80 to 120 per cent. of the mean content).

A comparison volume of Infra Red Spectra is being published shortly to remove a present need to maintain B.P. Chemical Reference Substances for the identification tests. Other physical tests include use of Nuclear Magnetic Resonance Spectroscopy in the identification of various corticosteroid sodium phosphates, and High Pressure Liquid Chromatography in the assay of Oestradiol Benzoate Injection.

A new B.P. Section on Surgical Dressings is included but Absorbent Lint is no

longer considered to be a suitable dressing for wounds, so standard dressings containing lint have been omitted.

An amendment to this edition (also effective from 1 December 1980) contained several minor amendments to monographs and formulae; it also included a new preparation of Strong Pholcodine Linctus and it deletes the recently introduced monograph for Zinc Stearate.

The Pharmaceutical Journal, 15 November 1980 drew attention to a reminder issued by the Department of Health on the change of potency of thyroxine tablets in the new edition of the B.P. The revised monograph (operative from 1 December) conforms to the international practice of referring thyroxine content to an anhydrous base and thus increasing the concentration by approximately 11 per cent. over the content previously expressed in terms of thyroxine pentahydrate. Pharmacists are advised to label containers of this preparation "B.P. 1980" until the end of June 1981.

The MAFF Information Bulletins 1980

This useful series continued in 1980, acquiring new recognition with the acquisition of green covers from issue No. 50 in September. The following topics were dealt with:

Bulletin number	Topic
44	Collaborative study results on butter-fat in cocoa butter and sorbic acid trials. Method for alcohol-insoluble solids in corn-on-the-cob.
45	Results of the second collaborative trial on bacon. Methods of analysis for sugars in chocolate.
46	Methods of analysis for caseins and caseinates; preparation, moisture, protein, free acidity, ash, pH sampling of partly or wholly dehydrated preserved milk (and edible casein and caseinates), sampling of condensed milk and powdered milk.
47	Results of the collaborative trials on trace metals in freeze-dried ox-liver and in fish muscle. Further reference to casein and caseinates and to methods of analysis for preserved milk products.
48	Methods of analysis to be used in collaborative trials on moisture determination in French fried potatoes (the potatoes sent were not fried potatoes) and for lead and cadmium in fresh meat.
49	Methods of analysis for neutral alcohol (preparation, alcohol content, colour, permanganate clearing time, aldehydes, higher alcohols, acidity, esters, volatile nitrogen bases, methanol, dry residue and furfural).
50	Results of moisture-in-the-potatoes trial. Alcohol-insoluble solids content of quick-frozen corn-on-the-cob and whole-kernel corn trial results.
51	Notes on Directive 80/777/EEC on natural mineral waters. Proposed methods for insoluble matter in instant coffee.
52	Results of a collaborative trial on vinyl chloride in foodstuffs. Draft of a community method of analysis for vinyl chloride released by materials into foods.
53	Setting up a collaborative trial on the determination of hydroxyproline in meat. EEC methods of analysis for cocoa and chocolate.

CHAIS Bulletins (ISSN 0141—5128)

The Consumer Hazards Information Service of the Laboratory of the Government Chemist sometimes appears to be a personal gesture of goodwill toward public analyst laboratories from the Superintendent of the Materials and Oils Division of the Government Chemist's Laboratory. The analytical difficulties covered by the Bulletins have tended to be those which have appeared

in ill-defined consumer safety areas such as transfer of contaminating metals from cooking utensils and food vessels, from paints on toys, the materials used in cosmetics, and so on. The topics dealt with in the *CHAIS Bulletins* for 1980 were as follows:

Issue number	Contents
11	Proposals for rewording parts of the sampling document in preparation, in connection with the EEC Directive on Cosmetic Products. Notification of the analytical changes in alcohol determination consequent upon the implementation of EEC Directive 76/766 (i.e. Discontinuation of use of Sikes Hydrometer and former Spirit Tables).
12	Colorants in Hair Dyes.
13	Boric acid in cosmetics. Sulphides in depilatory cosmetics.
14	A method proposed for inclusion in a British Standard for lead in tin coatings on food preparation vessels.

The Consumer Safety Bulletins

(Issued by the Consumer Safety Unit of the Department of Trade).

Six issues, Numbers 25 (from December 1979) and 26 to 30 were received in Public Analyst laboratories during 1980.

MAFF etc., Press Notices

In addition to the abovementioned sources of information, Press Notices are also sent out by Central Government, usually to announce publication of a Report or a Consultative Document. The Notices are of great value, but decisions about who receives them appear to be very arbitrary. The Notices received by most laboratories in 1980 were the following:

Notice number	Topic
9	Announcing the setting up of a review of the *Cream Regulations*, 1970.
55	Stating that a written reply in the House of Commons had revealed that the review of the *Food and Drugs Act* had been completed and that no consultative document would be issued. Consultations about strengthening the law on "Unfit Food" would be taking place.
65	Announcing publication of proposals for new labelling of food regulations.
75	Publicising the Minister of Agriculture's enthusiastic reception of a report by an *ad hoc* working group on Top-fruit.
88	Announcing proposals to amend the *Miscellaneous Additives in Food Regulations* (SI. 1974, No. 1121), the *Emulsifiers in Food Regulations* (SI. 1975, No. 1486), the *Antioxidants in Food Regulations* (SI. 1978, No. 105) and the *Solvents in Food Regulations* (SI. 1967, No. 1582), to control flavour enhancers.
92	Publicising a European Court decision that tax discrimination against certain spirit drinks (particularly Scotch Whisky) in certain member states was illegal.
93	Review of liquid milk distributive costings.
103	Prior warning of an intention to remove the 1p per pint premium on untreated milk, and to restrict sales. (No intermediate sales.) Grants toward the installation of small pasteurising plants at farms were promised.
105	Announcing publication of the FSC second report on claims and misleading descriptions.
121	Announcing proposals in a second consultation paper for regulations on meat export hygiene and inspection.
125	Assurances that the ARC's Meat Research Institute at Langford would continue.
127	An announcement that fresh and refrigerated meat from Argentina, Brazil and Uruguay must no longer contain lymphatic glands.
150	Announcing proposals to amend the *Meat Inspection Regulations* 1963 with a view to making slaughter-house charges more comparable.

Notice number	Topic
152	Announcing new milk (Special Designation) (Amendment) regulations, 1980. (SI. 1980, No. 488) which will give the common expiry date 30 April 1985 to all existing milk producer/retailer licences.
173	Giving the new telephone number 01–217–6342 for Ministry Press Enquiries.
242	Announcing the third report of the Steering Group on Food Surveillance: *Survey of Vinylidene Chloride Levels in Food Contact Materials and in Foods.* It favoured joint action between government and a responsible industry as an effective means of obtaining information on such subjects.
253	Drawing attention to generous subsidies available from FEOGA, for school milk. (Avon was the first authority to make use of this EEC subsidy.)
270	Announcing the *Preservatives in Food (Amendment) Regulations* (SI. 1980, No. 931) which extend the use of sorbic acid and Methyl-4-hydroxybenzoate, correct an error in the prescribed method of analysis for 2 hydroxy-biphenyl and contain a reminder that canned fruits may contain no preservatives other than nisin.
277	Referred to an intention of the MAFF to reduce the amount of form-filling required of farmers.
298	Referred to *Press Notice* No. 103 and required the origin of untreated milk supplied by distributors to be stated in each licence (thus halting bulk-supply) from 1 January 1981.
326	Announcing new members of the *Food Standards Committee* to serve until 31 August, 1983 and the names of the joint secretaries.
337	Announcing the signing of an Agriculture and Food Agreement with Venezuela.
342	Further comments on *Press Notice* No. 337.
365	Announcing publication of two FSC Reports, one on Bulking Aids in slimming foods and the other on modified starches.
375	Referred to coffee quotas.
379	Gave the text of a written reply on beer labelling. The Brewers' Society had recommended voluntary declarations of original gravity, and information about conditioning and method of dispense.
380	Drew attention to the MAFF Parliamentary Secretary's reference to adjustments in the Green Pound to favour the Bacon Industry, and to the view that Date Marking would be most satisfactory on a "Best before . . ." basis.
382	Drew attention to the MAFF Parliamentary Secretary's remarks at the Annual Kraft Foods Nutrition Awards Scheme prize-winners' Luncheon.
387	Gave the membership of the Food Additives and Contaminants Committee.
394	Referred to a second report on the costs of processing and distributing liquid milk.
404	Referred to European Community Council of Agricultural Ministers discussions on New Zealand butter, sugar, animal health (with particular reference to pigs) and poultrymeat hygiene.
433	A Christmas Message to the food and drink trade from The Rt. Honorable Peter Walker, Minister of Agriculture, Fisheries and Food.
435	Referred to *Press Notice* 103 and 298 and to a milk pasteurisation equipment grant scheme. From 1 January 1982 untreated milk Bottles must be marked "Raw Unpasteurised Milk" and the existing marking of green caps will be retained.
449	The Minister of Agriculture urged shoppers to buy British turkeys.
452	Announced publication of new Materials and Articles in Contact with Food (Amendment) Regulations (SI. 1980, No. 1838) which set a limit of 1 mg/kg for residual vinyl chloride monomer in articles for food contact, set out a prescribed method of analysis and specified a food wrap quality mark for articles which could be used for food contact.
454	Announced publication of four new food additive regulations (i) The *Emulsifiers and Stabilisers in Food Regulations* (SI. 1980, No. 1833), (ii) The *Miscellaneous Additives in Food Regulations* (SI. 1980, No. 1834), (iii) The *Antioxidants in Food (Amendment) Regulations* (SI. 1980, No. 1831) and (iv) The *Solvents in Food (Amendment) Regulations* (SI. 1980, No. 1832).
457	Published Annual Awards of the British Poultry Breeders and Hatcheries Association.
459	Announced publication of new Food Labelling Regulations (SI. 1980, No. 1849).
460	Implemented by means of The Milk (Special Designation) (Amendment) (No. 2) Regulations, (SI. 1980, No. 1863) the marking of untreated milk bottles with the words "Raw Unpasteurised Milk" (from 1 January 1982) and introduced a new licence.
471	Publicised a Parliamentary reply which referred to a newly published further ACP report on 2,4,5-T.

Notice number	Topic
474	Announcing the fourth report of the Steering Group on Food Surveillance: *Survey of Mycotoxins in the United Kingdom.*
477	Publicised comment by the Minister of Agriculture, Fisheries and Food on the mycotoxins report. He proposed to suspend importation of groundnut and cottonseed products until adequate screening is introduced, and had consulted with the dairy industry about their carrying out screening tests to ensure that there is no health hazard in drinking milk.
478	Advertised the Ministry's seventh Annual Report on Research and Development, price £5.95 by post from HMSO.
482	Concerned a new licence for imports of cooked meat and cooked poultry meat to comply with EEC Directives 77/99 and 80/215.

EEC Legislative Documents

As mentioned earlier in this review, perhaps a more permanent and useful document about EEC legislation will be a publication of the Institute of Trading Standards' Association, which promises to be ongoing and currently is called *A Comparative Directory of European Community Legislation as enacted in the United Kingdom.*

Another regular publication which is very useful is called *European Information Service*, published for the International Union of Local Authorities and the Council of European Municipalities, and is distributed from 26 Old Queen Street, London SW1M 9HP. In issue number 14 dated 14 May 1980, publicity was given to the formation of a U.K. Section of the *European Food Law Association*, one of whose declared aims is to provide an improved food law information and communications system.

The checklists which appear from time to time in *British Business* (a weekly news magazine of the Departments of Industry and Trade) are also useful, one having appeared on 4 January 1980, another on 28 March 1980 and another on 3 and 10 October, 1980. The *EFLA Newsletter*, Vol. 5 (1980) No. 3/4 gives a good list of EEC food legislation.

Actual *Official Journal of the European Communities* references which may prove useful are the following:

Date	Page	Subject
24 December 79	L.327/17	Directive 79/1066/EEC methods of analysis for coffee and chicory extracts.
24 December 79	L.327/79	Directive 79/1067/EEC methods of analysis for part or wholly dehydrated preserved milk.
28 December 79	L.344/9	Fixing the "guideline figure" for fat content of standardised whole milk for 1980/81 at 3·84 per cent. for U.K.
7 February 80	L.30/21	Extending the date for citranaxanthine in Directive 70/524/EEC (Feeding Stuff).
15 February 80	L.39/40	Repeal of Directive 71/354/EEC but with derogations for interim use of units of measurement such as millimetres of mercury, poise, stokes, yard, square yard and therm. The Annex on page L.39/43 gives preferred SI units.
25 February 80	L.51/1	Nominal quantities for prepacked products.
19 April 80	L.102/26	Limits for fenchlorphos in fruit and vegetables.
22 April 80	L.104/18	Further reference to egg yolk colourant citranaxanthine in Directive 70/524/EEC.
29 April 80	L.110/1	Extending the 1979/80 milk year.
20 May 80	L.124/17	Providing for amendments of definition in Directive 74/63/EEC to provide for legislation concerning micro-organisms in animal feeding stuffs.

Date	Page	Subject
23 June 80	L.155/23	Amending Directive 74/329/EEC on stabilisers, thickeners, etc., in food (makes reference to microcrystalline cellulose, xanthan gum, limits use of Ghatti gum and extract of quillaia and permits ammonium phosphatides, polyglycerol poly-ricinoleate and sundry sorbitan compounds of fatty acids.
17 July 80	L.184/9	Common wheat for breadmaking.
18 July 80	L.185/48	Age limits for feeding zinc bacitracin and spiramycin, flavophospholipol and mentioning xanthan gum, fumaric acid, malic acid and some other emulsifiers in feeding stuffs.
22 July 80	L.188/23	Tolerances with reference to cat and dog food.
27 July 80	L.195/6	Making provision for resinated wines.
16 August 80	L.213/42	Method of analysis for vinyl chloride monomer in articles for food contact.
30 August 80	L.229/1	Marketing for natural mineral waters, Directive 80/777/EEC.
8 September 80	C.228/10	Proposals for a directive on Toy Safety.
24 September 80	L.251/17	Extending use of spiramycin in animal feeds.
27 September 80	L.254/35	Method of analysis for erucic acid in fats for human consumption.
3 October 80	C.256/2	Text of a letter from the European Commission concerning the consequences of Case 120/78 (the "Cassis de Dijon" case).
7 October 80	L.263/8	Correction to the method of analysis for the biphenyl type preservatives allowed in citrus fruit.
15 October 80	L.270/14	Method for the determination of total water in frozen chickens.
31 October 80	L.288/13	Rules for implementing Regulation (EEC) No. 2967/76 on water content of frozen chickens.
1 November 80	L.292/75	Amending Regulation (EEC) No. 2967/76 on water content of frozen chickens (date extension for phosphated chicken meat).
22 November 80	C.305/2	Proposal for a regulation concerning the use of hormones and substances with thyrostatic action in animals for meat.
31 December 80	L.343/22	Amendment to Regulation (EEC) No. 103/76 ref. sizes of redfish and anchovies.

Further EEC matters are discussed in the following documents:

Commission of the European Communities Reports

ISBN 92–825–1172–3 *Consumer Protection and Information Policy.*

ISBN 92–825–1232–0 *Food Additives and the Consumer.*

ISBN 92–825–1752–7 *Symposium on Enforcement of Food Law.*

Agreements:

European Communities No. 30 (1980) Community—Cost Concertation Agreement. Project ref. Analysis of Organic Micro-pollutants in water.

European Communities No. 33 (1980) Community Cost Concertation Agreement. Project on Effects of Processing on Physical Properties of Foodstuffs.

House of Commons ISBN 0 10 283380 X:

Implications for the U.K. of the C.A.P. on milk and dairy products.

Community Bureau of Reference:

"List of Community Bureau of Reference. Reference Materials and their Certified Properties".

County Councils Gazette 73, No. 2, May 1980, 42:

"EEC Community processes and how local government can influence those processes."

Milk

The three Ministry *Press Notices* numbers 103, 298 and 435 (mentioned under MAFF, etc., *Press Notices*, above) provide for a new licensing system to be introduced at the beginning of 1981 for unpasteurised milk, which will identify the producer. The new designation will, from 1 January 1982, be Raw Unpasteurised Milk and the 1p per pint premium will cease to apply. The new Farm Bottled Untreated Milk Distributory Licence will be issued by the Ministry.

The Milk (*Special Designation*) (*Amendment*) *Regulations, 1980* (*SI. 1980, No. 488*) began the process by providing that existing licences shall terminate on 30 April 1985 and when renewed will all terminate together at the end of 5-year periods, but were revoked by SI. 1980, No. 1863.

The Milk (*Special Designation*) (*Amendment*) (*No. 2*) *Regulations, 1980* (*SI. 1980, No. 1863*). These regulations changed some definitions and licence conditions to provide that raw unpasteurised milk shall be packed for retail at the place of production. Selling and marking provisions were altered.

The Weights and Measures Act 1963 (*Milk*) *Order 1979* (*SI. 1979, No. 1752*) Re-enacts the Weights and Measures (Exemption) (Milk) Order 1966 and the Weights and Measures (Prepacked Milk in Vending Machines) Order 1976 and provides that milk which is not prepacked shall be sold only by capacity measure or by weight, and quantities exceeding 50 ml may only be prepacked in quantities of $\frac{1}{3}$ pint or multiples of $\frac{1}{2}$ pint, or in metric quantities of 200 ml, 250 ml, 500 ml, 750 ml, 1 litre, 2 litres and thereafter in multiples of 500 ml. And for vending machine sale, quantities of less than $\frac{1}{2}$ pint may be prepacked provided that conspicuous statements in writing indicate that it is for machine sale only, and what the quantity is.

The Milk (*Great Britain*) *Order 1980* (*SI. 1980, No. 48*) revoked previous Milk (Great Britain) Orders but had its retail price schedules substituted by those in an Amendment Order (SI. 1980, No. 1175), then was modified by an Amendment (No. 2) Order (SI. 1980, No. 1295) which changed the price of milk sent for heat treatment, and again by the Amendment (No. 3) Order (SI. 1980, No. 1294).

Circular FSH 1/80 (dated 9 July 1980) of the MAFF. Informed Food and Drugs Authorities that the guideline figure for imported standardised whole milk had been fixed by EEC Regulation No. 2932/79 at 3·84 per cent. for the year beginning 1 June 1980.

The Brucellosis (*England and Wales*) (*Amendment*) *Order 1980* (*SI. 1980, No. 890*). The Order substitutes new schedules to replace those naming "Eradication Areas" and "Attested Areas" in the 1979 Amendment Order and deletes Article 4 (1) from the Brucellosis (England and Wales) Order 1978.

The Brucellosis (*England and Wales*) (*Amendment*) (*No. 2*) *Order 1980* (*SI. 1980, No. 1689*). Makes alterations to Articles 2, 4, 6, 7, 8, 9, 10, 11, 12, 13 and 27 and again changes the schedules.

Also included in the milk section, because of the association with farms and dairies, are the following:

The Diseases of Animals (*Approved Disinfectants*) (*Amendment*) *Order 1980* (*SI. 1980, No. 25*).

The Diseases of Animals (*Approved Disinfectants*) (*Amendment*) *Ono. 2*) *Order 1980* (*SI. 1980, No. 955*).

The Diseases of Animals (*Fees for the Testing of Disinfectants*) *Order, 1980* (*SI. 1980, No. 1383*).

British Standard BS. 3095: Part 1: 1980. Method for the Determination of the Freezing Point Depression of Milk Part 1. Hortvet method and Thermistor cryoscope method.

British Standard BS. 3095: Part 2: 1981. Determination of the Freezing Point Depression of Milk. Part 2. Recommendations for the interpretation of the freezing point depression of herd milk.

British Standard BS. 5497: Part 1: 1979. Precision of Test Methods. Part 1. Guide for the determination of repeatability and reproducibility for a standard test method. (A third part, on storage of samples, was issued early in 1981).

Food (Standards, Methods of Analysis, etc.)

Relatively few statutory instruments relating to food were issued in 1980. They were:

The Butter and Concentrated Butter Prices (*Amendment*) *Order 1980* (*SI. 1980, No. 4*). The Order is of interest only inasmuch as it provides for metric weight packs.

The Chloroform in Food Regulations 1980 (*SI. 1980, No. 36*). Prohibits the sale of food containing added chloroform after 1 April 1981.

The Bees Act 1980 (*Commencement*) *Order 1980* (*SI. 1980, No. 791*). Mainly of interest because of changes in the Agriculture (Miscellaneous Provisions) Act 1941 and the Agriculture (Miscellaneous Provisions) Act 1954. Provisions for controlling pests and diseases in bees are in the Bees Act.

The Preservatives in Food (*Amendment*) *Regulations 1980* (*SI. 1980, No. 931*). Redefine "canned food" (so that Nisin becomes the only permitted preservative). Permits sorbic acid in cake icing pastes, for fruit-in-syrup intended as an ingredient for ice-cream and for some soup concentrates, and extends the use of some hydroxyl benzoates. The regulations also modify the analytical instructions which appeared in *The Preservatives in Food Regulations 1979*.

The Antioxidants in Food (*Amendment*) *Regulations, 1980* (*SI. 1980, No. 1831*) Implement EEC provisions.

The Solvents in Food (*Amendment*) *Regulations 1980* (*SI. 1980, No. 1832*) Implement EEC provisions.

The Emulsifiers and Stabilisers in Food Regulations 1980 (*SI. 1980, No. 1833*). Implement EEC provisions.

The Miscellaneous Additives in Food Regulations 1980 (*SI. 1980, No. 1834*). Implement EEC provisions. No overall permitted list of flavour enhancers has yet been prepared.

The Materials and Articles in Contact with Food (*Amendment*) *Regulations* (*SI. 1980, No. 1938*). Provide for a maximum limit of 1 mg/kg for vinyl chloride monomer in materials intended for food contact, provide a symbol for identifying such materials and prescribe the method of analysis to be used. ("British

Business" for 10 October 1980, p. 257, indicated that further regulations to implement the EEC Directive 78/142/EEC requirement that VCM shall not be transferred to food would soon be made.)

The Food Labelling Regulations 1980 (*SI. 1980, No. 1849*). The regulations implement the EEC Directives 79/112/EEC and 77/94/EEC. Alcoholic drinks are affected in accordance with the requirements of EEC Directive 76/766/EEC.

The six regulations which end the above list came out at the end of December 1980 and brought to an end the collection of sundry proposals and guidance documents of which the following short list might be regarded as typical.

Proposals for New Labelling of Food Regulations (*11 February 1980*)

Proposals to Amend Food Additive Regulations (*28 February 1980*)

Proposed Amendment to the Preservatives in Food Regulations (*21 April 1980*)

"*Water Activity Determination*", Labuza, Acott, Tatini and Lee (*J. Food. Sci* 1976, **41,** 910–917).

Intermediate Water Foods, (Edited by Davies Birch and Parker), Applied Science Publishers.

Quantitative Analysis of Styrene Monomer in Polystyrene and Foods, (J. R. Withey) (*Environmental Health Perspectives*, 1976, **17,** 125–133).

Draft Methods of Analysis III/1521/78—EN Working paper (Annexes I, II and III) Methods for migration into distilled water, acetic acid and ethanol, Method for migration into rectified olive oil (Part I: Single-layer materials) (Part II: Materials composed or two or more layers of plastics), and Method for migration into sunflower oil (or standard triglyceride mixture type HB 307).

Draft Method of Analysis III/464/79. Determination of Vinyl chloride in Foodstuffs.

Draft Method of Analysis III/465/79. Determination of Vinyl chloride in Materials and Articles.

MAFF. Legislation list (Governing labelling advertising and composition of food) (Ref: FS 7199. June 1980).

Statutes in Force. FOOD. ABD 53:1:1 and AB 53:1:2 and AB 53:1:3.

LACOTS Code of Practice (published also by the United Kingdom Association of Frozen Food Producers and the Shellfish Processors Association) *On Scampi in Breadcrumb Coatings* (Ref: PB/LE/41/3). The code allows use of polyphosphates (up to 0·5 per cent. as P_2O_5) and an average scampi content of each pack, of 50 per cent., with no individual pack containing less than 45 per cent. when 250-gram samples are softened under a water spray without defrosting the actual scampi, and scraping off the coating and weighing the frozen "cores" as scampi. (Clearly this method allows any other material in the cores, including water, to count as fish.)

Newspaper announcement (December 1980) (derived from forthcoming labelling rules) "Shrimps" number more than 180 to the pound. "Prawns" are the same fish but large enough to be fewer than 180 to the pound.

Newspaper announcement (May 1980). A Government Committee on Medical Aspects of Food Policy recommended that Vegetable Protein Foods which simulate meat shall contain (on a dryweight basis) not less than 45 per cent.

protein and preferably 50 per cent. The meat simulating protein shall contain for each 100 grams of protein not less than 2 mg of thiamin, 1·6 mg of riboflavin, 10 μg of vitamin B_{12}, 20 mg of iron and 20 mg of zinc. In catering, replacement should not be greater than 30 parts of vegetable protein to 70 parts of meat protein.

DHSS "*Guidelines on Pre-cooked Chilled Foods*" (ISBN 011 320733 6) includes some suggested microbiological criteria including a total aerobic colony count at 37°C for 48 hours of 100,000 per gram. They also suggest limits of:

Salmonella	Not detectable in 25 grams
E. coli	Less than 10 per gram
S. aureus	Less than 100 per gram
C. perfringens	Less than 100 per gram

First Supplement to McCance and Widdowson's The Composition of Foods (by A. A. Paul and others) HMSO (ISBN 0 11 450038 X) Amino acid composition and Fatty acid composition.

International Standardisation of Fruit and Vegetables: Fresh Strawberries (ISBN 92–64–02051–9).

Random copies of a MAFF publication called *Food Facts* appeared in the laboratories from time to time in 1980, the intention apparently being to supply information from the National Food Survey. Issue No. 1 (3 March 1980) thus gave Household Food Consumption statistics up to the 3rd Quarter 1979. Issue No. 4 (2 June 1980) gave them for the 4th Quarter. Issue No. 8 (22 September 1980) dealt with the 2nd Quarter 1980. The tables marked "Table 3" seemed to indicate a falling off in recommended total food intake and iron. In addition Issues No. 6 (16 June 1980) advertised the Annual Report of the National Food Survey Committee and No. 7 made reference to increasing U.K. self-sufficiency in food production.

Food Reports, etc.

Joint FAO/WHO Expert Committee on Food Additives (*FAO Food and Nutrition Paper 7*) "*Specification for Identity and Purity of Food-colours, Enzyme preparations and other Food-additives*" (ISBN 92–5–100651–2). Mainly tentative specifications but annexes contain methods of analysis for Iron oxides, Glucose isomerase activity, and Pullulanase activity.

Joint FAO/WHO Expert-Committee on Pesticide Residues (FAO *Plant Production and Protection Paper 20*) "*Pesticide Residues in Food—1979*" (ISBN 92–5–100922–8). Includes many recommended Acceptable daily intakes, Maximum residue limits, Extraneous residue limits and Guideline levels.

Pesticides and Commodities on which the U.K. intends to give Limited Acceptance to Codex Alimentarius Commission Limits. Issued with MAFF letter on *Standards for Pesticide Residues in Foodstuffs* (Ref. SW 4833. 1 August 1980).

U.K. Pesticides Safety Precautions Scheme. (Agreed between Government Departments and Industrial Associations) Revised. MAFF Ref: SW 4768.

FAO Food and Nutrition Paper 14/2 Manuals of Food Quality Control.

"*2. Additives and Contaminants Techniques*".

FAO Food and Nutrition Paper 14/3 Manuals of Food Quality Control. "*3. Commodities*".

Commission of the European Communities *Reports of the Scientific Committee for Food 1979* (ISBN 92–825–1638–5). Flavours, Asbestos, Natamycin. (Includes limits for materials such as coumarin or hydrocyanic acid transferred by use of natural flavourings).

FSC Report on Meat Products, 1980

FSC Second Report on Claims and Misleading Descriptions, 1980

FACC Report on Modified Starches. FAC/REP/31 (includes some methods of analysis).

FACC Report on the Review of Bulking Aids (non-nutritive ingredients) in Foods FAC/REP/32.

MAFF Food Surveillance Paper, No. 3 "Survey of Vinylidene Chloride Levels in Food Contact Materials and in Foods".

MAFF Food Surveillance Paper, No. 4 "The Working Party on Mycotoxins".

DHSS Report on Health and Social Subjects 17. Foods which Simulate Meat (ISBN 0 11 320722 0).

"*Medical Aspects of Dietary Fibre*". A report of the Royal College of Physicians, including a discussion of available methods of analysis. Although the report makes recommendations it admits that not much is known about dietary fibre in nutrition.

FAO Food and Nutrition Paper 15. "*Carbohydrates in Human Nutrition*" (ISBN 92–5–100903–1). Concludes that low carbohydrate diets are apt to cause ketosis and that there is little scientific evidence for or against a change in intake of "dietary fibre". Analysis of food carbohydrate (including "dietary fibre") is discussed.

In addition, passing note might be made of two items in the June 1980 issue of Food Manufacture. On page 7 a statement by Roy Jenkins to the British Industrial Biological Research Association included the opinion that it amounts to squandering resources when duplication of toxicological testing of food additives in different countries was done in ways which yielded contradictory results. (The Food Manufacture report seemed to imply that Mr. Jenkins favoured toxicological decision by vote!) On page 27 was an interesting advertising article about Messrs. Cadburys carrying out in-line analyses of their Bournville products by NMR.

The Coca Cola Export Corporation sent a circular letter dated 8 September 1980 to all Food and Drugs Authorities about cans of Coca Cola circulating in the U.K. without labels complying with U.K. regulations. They explained that the cans originated with Dutch canners and had been distributed by wholesalers who had disregarded instructions about destination. The letter complained that local authorities had not wholly co-operated in assisting in the withdrawal of the offending cans, and that U.K. retailers believe that they can ride rough-shod over U.K. Food Regulations. Many Public Analysts subscribe

to the same view, especially since Mansfield Magistrates awarded £13,318 costs against Nottinghamshire County Council for trying to enforce the Fish and Meat Spreadable Products Regulations 1968, and the "Cassis de Dijon" case has tended to promote a belief that compositional food standards no longer have validity in EEC member states. The LAJAC Code of Practice on Breaded Scampi also appears to some to be a licence to adulterate, hence retailers may ride rough-shod over Regulations.

Fertilisers and Feeding Stuffs

The Fertilisers (Sampling and Analysis) (Amendment) Regulations (SI. 1980, No. 1130). These regulations prescribe official methods of analysis for non-EEC Fertilisers.

Medicines, Poisons, etc.

It is becoming increasingly difficult to decide which parts of Medicines legislation should be noted in Public Analysts' Laboratories. Sir John Butterfield was reported in the *Pharmaceutical Journal* for 19 January 1980 as feeling concern about legislation governing the testing and marketing of new drugs, since it had led to testing overseas of over 80 per cent. of new drugs discovered in the U.K. As far as actual hazard is concerned, the DHSS magazine, *Health Trends*, for February 1980 (p. 11), showed that child poisoning deaths occur most with analgesics, next most frequently with anti-depressants and then with hypnotics.

The transitional period in force since 1 February 1978 [see: Medicines (Pharmacy and General Sale Exemption) Order 1977 SI. 1977, No. 2133 p. 3] ended on 1 February 1980, and provisions laid down in the Medicines (General Sale List) Order 1977 made a number of products, which had formerly been on general sale, available only from a pharmacy. Examples would be packs of aspirin containing more than 25 tablets, paracetamol, medicinal products containing more than specified quantities of Vitamin A, preparations of iron, phenolphthalein, senna, boric acid, etc. The sale of some animal medicaments became restricted at the same time. The Orders thus brought into effect are:

(1) *The Medicines (General Sale List) Order, 1977 (SI. 1977, No. 2129)*

(2) *The Medicines (General Sale List) (Amendment) Order, 1979 (SI. 1979, No. 315)*

(3) *The Medicines (General Sale List) (Amendment) Order, 1980 (SI. 1980, No. 7)*

Assistance with the welter of medicines regulations was made available by the Pharmaceutical Press during 1980, as shown below.

Medicines and Poisons Guide 2nd Edition 1980 (ISBN 0–85369–134–7)

The "Introduction" explains the repeal of the *Pharmacy and Poisons Act, 1933*, the *Pharmacy and Medicines Act, 1941*, and the *Therapeutic Substances Act, 1968*, and their replacement by Part III of the Medicines Act, 1968, etc. A section on "Definitions "explains such terms as "Appropriate Quantitative

Particulars", etc. Section 1 differentiates "General Sale List Medicines", "Pharmacy Medicines", "Prescription-only Medicines", etc., and the exemptions. Page 15 explains "Labelling". Page 19 gives the "Fluted bottles" requirements. "Controlled Drugs" are dealt with on page 20. An alphabetical list of "Medicines for Human Use" begins on page 25. "Veterinary Medicines" are listed on page 50. Ingredients of exempted Veterinary Drugs with a Product Licence of Right are shown on page 68. Proprietary veterinary drugs are shown on page 69. Drugs for incorporation into animal feeds appear on page 71 along with Veterinary drugs for supply to animal feed manufacturers. Non-medicinal poisons are shown on page 72 and a list of Non-medicinal poisons is given on page 76. (No medicine man should be without a copy!)

The Poisons List Order, 1980 (*SI. 1980, No. 126*). This Order deletes from Part II of The Poisons List Order, 1978, a section dealing with Diamines.

The Poisons (*Amendment*) *Rules, 1980* (*SI. 1980, No. 127*). The Poisons Rules 1978 make the consequential deletions in Schedule 3 Group II, and of paragraph 1 in Schedule 6 which resulted from the deletion brought about by SI. 1980 No. 126. The deletions follow a control of hair dyes, consequent upon EEC requirements, by the Cosmetic Product Regulations, 1979.

The Medicines (*Chloroform Prohibition*) *Amendment Order, 1980* (*SI. 1980, No. 263*). The Order permitted the sale of medicinal-product Toothpaste containing up to 4 per cent. of chloroform until 1 January 1981.

The Medicines (*Exemptions from Restrictions on the Retail Sale or Supply of Veterinary Drugs*) (*Amendment*) *Order, 1980* (*SI. 1980, No. 283*). The Order changed The Medicines (Exemptions from Restrictions on the Retail or Supply of Veterinary Drugs) Order, 1979 by changing the words "is not on a general sale list", and by substituting new schedules.

The Medicines (*Exemption from Restrictions on the Retail Sale or Supply of Veterinary Drugs*) (*Amendment*) (*No. 2*) *Order, 1980* (*SI. 1980, No. 1650*). This amendment Order substituted new schedules for the Schedules in the Medicines (Exemptions from Restrictions on the Retail Sale or Supply of Veterinary Drugs) Order, 1979, (as amended by SI. 1980, No. 283).

The new British Pharmacopoeia is mentioned elsewhere in these lists.

The Medicines (*Prescriptions Only*) *Order, 1980* (*SI. 1980, No. 1921*)

The Medicines (*Sale or Supply*) (*Miscellaneous Provisions*) *Regulations 1980* (*SI. 1980, No. 1923*). Although no copies of these regulations were available at the time of writing these notes, it should not be overlooked that the new regulations revoke SI. 1977 No. 2132 which dealt with enforcement of Sections 53, 54 and 66 of the Medicines Act, and re-enact them.

The Medicines (*General Sale List*) *Order, 1980* (*SI. 1980, No. 1922*).

The Medicines (*Pharmacy and General Sale*) (*Exemption*) *Order, 1980* (*SI. 1980, No. 1924*). As with SI. 1980, No. 1923, an earlier Order (SI. 1977, No. 2133) which provided for Public Analysts and Agricultural Analysts to be supplied with certain "Prescription only" Medicines is revoked.

Consumer Safety

Until Dr R. J. Mesley of the Government Laboratory pointed out the significant distinctions, it is probable that few public analysts had been sufficiently involved with the Consumer Protection Act 1971 and the Consumer Safety Act 1978 to appreciate why there were two Acts. The distinction is essentially that enforcement of earlier regulations dealing with consumer safety and food safety are enforced only at point of sale. Divided authority arises within the compass of the Consumer Protection Act however, because if an article is actually in contact with food at the time of sale, the matter becomes the responsibility of the MAFF, whereas if it is sold separately, the responsibility belongs to the Department of Trade. At present the regulations made under the Consumer Protection Act 1971, and which involve analysis, are the following:

SI. 1972, No. 1957. *The Cooking Utensils (Safety) Regulations.*
SI. 1974, No. 226. *The Pencils and Graphic Instruments (Safety) Regulations.*
SI. 1974, No. 1367. *The Toys (Safety) Regulations.*
SI. 1975, No. 1241. *The Glazed Ceramicware (Safety) Regulations.*
SI. 1976, No. 454. *The Enamelware (Safety) Regulations.*
SI. 1978, No. 1354. *The Cosmetic Product Regulations.*
SI. 1978, No. 1927. *The Materials and Articles in Contact with Food Regulations.*
SI. 1980, No. 1838. *The Materials and Articles in Contact with Food (Amendment) Regulations.*

Although the hazard might appear to be related to that from cooking utensils and other food contact vessels, these Materials in Contact with Food regulations are made under *The European Communities Act 1972.*

The Consumer Safety Act 1978. The Consumer Protection Act Commencement Order (SI. 1978, No. 1445) excludes Section 10.1, therefore Schedule III to the Act, which will repeal the Protection Acts, is not yet in force. Cosmetic Products are likely to be transferred during the implementation of the EEC Cosmetics Directives because purity criteria relating to the 300 permitted colours could only be investigated on ingredients, and ingredients cannot be reached under the point of sale arrangements of the Consumer Protection Act. The Safety Act gives power to the Secretary of State to make Prohibition Orders effective for one year. Such orders have included:

SI. 1978, No. 1728. *The Nightwear (Safety) Order.*
SI. 1979, No. 44. *The Balloon-making Compounds (Safety) Order.*
SI. 1979, No. 887. *The Tear-gas Capsules (Safety) Order.*
SI. 1980, No. 136. *The Dangerous Substances and Preparations (Safety) Regulations.* (These are now in force.)

The 1980 regulations are the first *regulations* made under the Act and they permanently prohibit TRIS, Vinyl chloride monomer as an aerosol propellant, and control solvents in Glitter-lamps. The Regulations also refer to a 43 page

schedule of "dangerous substances" in SI. 1978, No. 209, and to "Flash Point" tests.

SI. 1980, No. 958. *The Novelties (Safety) Regulations.*

These 1980 regulations permanently prohibit benzene in balloon-making compounds, Tear-gas capsules, and Stink bombs containing more than 1·5 ml of sulphides of ammonia.

SI. 1980, No. 725. *The Upholstered Furniture (Safety) Regulations.*

The regulations prescribe tests to verify the resistance of upholstery to ignition by smouldering cigarettes and lighted matches, and provide for warning labels upon furniture which does not satisfy the tests. From 1983 furniture which does not satisfy the tests will be banned from commercial transactions.

Health and Safety

Further Review of the Safety for Use in the U.K. of the Herbicide 2,4,5-T. An Advisory Committee on Pesticides report dated December 1980 which reaffirms that 2,4,5-T is safe to use.

The Notification of Accidents and Dangerous Occurrences Regulations 1980 (SI. 1980, No. 804).

"Dangerous occurrences" including gas-pressure accidents, electrical faults, fire, escape of hazardous substances, bursting of pipelines, etc., (whether or not they result in injury) must be reported within seven days to the DHSS who will also report them to the Health and Safety Executive. (Fatal or major injury accidents should be reported direct to both authorities.) A general guidance booklet *Health and Safety Series Booklet HS(R)5* (ISBN 0–11–883413–4) from HMSO is available.

The Control of Lead at Work Regulations, 1980 (SI. 1980, No. 1248).

The regulations impose requirements upon employers of persons who may be exposed to lead at work to take steps to control contamination and safeguard employees' health.

DHSS Report on Lead in the Environment "Lead and Health" (ISBN–0–11 320728–X) *The Lawther Report.* The report recommends that steps to reduce exposure to lead should be taken on grounds of prudence. Blood levels below 35 μg per 100 ml (μg/dl) will not produce a health hazard but the cause of higher levels should be investigated.

Recommended Health-based Limits in Occupational Exposure to Heavy Metals WHO Technical Report Series 647 (ISBN 92–4–120647–0). This booklet is recommended. Although mainly text it gives normal blood levels for most metals.

Cadmium in the Environment and its Significance to Man. D of E Pollution Paper No. 17.

Evaluation of the Carcinogenic Risk of Chemicals to Humans. WHO IARC Report of Working Party (ISBN 92–832–1402–1).

Developments in Tobacco Products and the Possibility of "Lower-Risk" Cigarettes. Second report of the Independent Scientific Committee of Smoking and Health DHSS (ISBN 0–11–3207174).

Road Traffic. The Breath Test Device (Approval) (No. 1) Order, 1980. The

Order added the Draegar ALERT to the devices approved for roadside testing for alcohol in drivers' breath.

Health and Safety Executive Leaflets

Guidance Note EH 15/79 Threshold Limit Values for 1979.

Advice to Local Authorities LAA1C/C/1.52/3 Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972.

Advice to Local Authorities LAA1C/C/1.36/3 Fire Hazard from Disposable Cigarette-Lighters.

Guidance Note CS3 Storage and use of Sodium chlorate.

A Guide to the *Health and Safety At Work Act* (ISBN 0–11883264–6).

The Packaging and Labelling of Dangerous Substances Regulations 1978 (*SI. 1978, No. 209*). The normal local authority laboratory needs a copy of these regulations.

National Radiological Protection Board Consultative Document: *Criteria Relating to the Approval of Consumer Goods Containing Radioactive Substances.*

The Radioactive Substances (*Smoke Detectors*) *Exemption Order, 1980.*

Radioactive Fallout in Air and Rain 1979 (AERE-R 9672).

Waste Disposal

The Control of Pollution (*Supply and Use of Injurious Substances Regulations 1980* (*SI. 1980, No. 638*). Mainly about polychlorinated biphenyl, etc.

The Control of Pollution (*Special Waste*) *Regulations, 1980* (*SI. 1980, No. 1709*). Special wastes contain "Listed Substances" (Schedule 1 to the regulations), materials "Dangerous to life" (as defined) having a flash point as BS 3900: Part A. 8: 1976 of less than 21°C, or a "Prescription only" medicine.

D of E Circular/80 Gives guidance on SI. 1980, No. 1709

D of E Waste Management Papers

No. 16 Wood Preserving Wastes
No. 20 Arsenic-bearing Wastes
No. 21 Pesticide Wastes.

Not all the booklets in this series would be useful in laboratories, but 15 of them are technical memoranda, so it may be surprising that laboratories do not hold all but numbers 1, 2, 3, 4, 5, 10 and 22.

A small reminder about how wide ranging the chemistry of effluent treatment is becoming can be obtained from a little group of Abstracts which appeared (Ref: PC/gb) with *Process Biochemistry* Dec 1979.

Building and Reclaimed Land

D of E document ICRCL 38/80. Redevelopment of Contaminated Land. Tentative Guidelines for Acceptable Levels of Selected Elements in Soils. This is still a consultation document but it contains tables of typical values of toxic metals content in normal and contaminated land, implied maxima for arable soils, and indications of levels of contaminants in wastes to qualify them as "Special Wastes".

D of E Forest Products Research Laboratory Timberlab Analytical Methods. Tributin Tin.

British Standard BS 3148. Tests for Water for Making Concrete.

Weights and Measures, etc·

Changing to the Metric System (*Conversion factors, symbols and definitions* (5th edition) National Physics Laboratory (ISBN 0–11–480046–4).

The Average System of Weights and Measures Leaflet of the National Metrological Co-ordinating Unit (*Croydon* CR9 1LG).

The Weights and Measures (*Marking of Goods and Abbreviation of Units*) (*Amendment*) *Regulations 1980* (*SI. 1980, No. 8*).

The Trade Marks (*Amendment*) *Rules 1980* (*SI. 1980, No. 221*).

The Trade Marks (*Amendment No. 2*) *Rules 1980* (*SI. 1980, No. 1931*).

The Fabrics (*Misdescription*) *Regulations 1980*) (*SI. 1980, No. 726*).

The Measuring Instruments (*EEC Requirements*) *Regulations 1980* (*SI. 1980, No. 1058*).

The Weights and Measures (*Packaged Goods*) (*Amendment*) *Regulations 1980* (*SI. 1980, No. 1064*).

The Units of Measurement Regulations 1980 (*SI. 1980, No. 1070*).

The Units of Measurement (*No. 2*) *Regulations 1980* (*SI. 1980, No. 1742*).

One might be forgiven for ending this review by drawing attention to two items which appeared in the journal *Chemistry International* 1980, **1,** 32, and 1980, **3,** 2. They indicate how, in these days of swamping quantities of paper, it is very easy to be taken in by a hoaxer. The articles concern a life history of Claude Emile Jean-Baptiste Litre, the adoption of whose unit of volume as an SI unit, named after him by Antoine de Fourcroy, had occurred just 200 years after Litre's death. This myth will now never be quite eradicated from the beliefs of up-and-coming scientists.

J. Assoc. Publ. Analysts, 1981, **19**, 21–30

The Identification of Bulk Asbestos and Monitoring of Airborne Fibre.
Part I: Identification

D. G. Forbes and G. W. White

Muter and Hackman, Kennington, London

A review is given of the literature on asbestos identification. Methods currently in use in one laboratory are described, results over a period are analysed, and a discussion is given of typical problems encountered in identification.

Asbestos mining began in the late nineteenth century, and by about 1920 enough evidence had accumulated to indicate that exposure to asbestos dust could lead to the frequently terminal lung disease now known as asbestosis. The Merewether report of 1930 led to the first official government acknowledgement of the problem in the Asbestos Regulations 1931. It emerged in the 1960s that exposure to asbestos dust was far more dangerous than had been thought, being associated with asbestosis, bronchial carcinoma and mesothelioma, and more stringent control measures were set by the Asbestos Regulations 1969. More recently, the Health and Safety Commission set up, in 1976, an Advisory Committee on Asbestos, whose work has resulted in two interim reports[1,2], and a two-volume final report[3], known as the Simpson report, after its chairman. Among the many recommendations of this report were control limits for exposure to dust of 0·2 fibres/ml for crocidolite, 0·5 fibres/ml for amosite, and 1 fibre/ml for chrysotile, each determined over a 4-hour sampling period. These are much lower than the Threshold Limit Values (TLV) for 1979[4], in which the limit for all forms of asbestos was 5 fibres/ml, > 5 μm in length, and the Advisory Committee recommended adoption of the new lower limits by the end of 1980.

In these circumstances there has been a large growth in demand for analytical services, involving both the identification of bulk samples of asbestos and the monitoring of airborne fibre. Industrial employers and local authorities are faced with the problems of existing asbestos installations, some of which may have begun to disintegrate; asbestos manufacturers and firms specialising in stripping and removal of asbestos are also involved in the protection of their workers and members of the public, from exposure to asbestos dust.

The present paper reviews some of the literature on asbestos analysis, and describes the work of one laboratory involved in asbestos identification.

Literature Review

The types of asbestos encountered in the analytical laboratory may range from loosely-bonded or easily-frayed material (50–100 per cent. fibre), such as lagging, rope, textiles or filters, to well-bonded materials (5–50 per cent. fibre)

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TABLE I

CHARACTERISTICS OF ASBESTOS*

			Chrysotile	Amosite	Crocidolite	Anthophyllite	Actinolite	Tremolite
Crystal system			Monoclinic	Monoclinic	Monoclinic	Orthorhombic	Monoclinic	Monoclinic
Specific gravity			2·36–2·55	2·6–3·4	3·0–3·45	2·85–3·4+	3·03–3·5	2·9–3·2
Acid resistance	(4M HCl)		Moderate	Good	Very good	Very good	Good	Very good
Morphology			Curly in bulk samples	Straight fibres	Usually straight fibres	Bunched or radiating aggregates		
Colour			Grey/white to pale yellow/green	Grey/white to pale yellow/brown	Lavender blue	Grey/white to pale yellow/green	Bright to dark green	White (when pure) to dark grey
			Nil	Weak	Strong	Weak to moderate	Greyish/green	Nil
Pleochroism	Plane polarised light			α,β-pale brownish yellow	α,β-dark blue		α,β-pale green/blue	
				γ-pale brown	γ-pale grey/blue	γ-strongest absorption	γ-deep green or green/blue	
Refractive indices†	Plane polarised light	α	1·536–1·551	1·667–1·678	1·675–1·696	1·598–1·657	1·619–1·668	1·604–1·619
		β	1·544–1·556	1·678–1·692	1·680–1·707	1·607–1·671	1·641	1·610
		γ	1·549–1·561	1·691–1·707	1·687–1·710	1·619–1·682	1·642–1·687	1·627–1·642

TABLE I (CONTINUED)

		Chrysotile	Amosite	Crocidolite	Anthophyllite	Actinolite	Tremolite
Birefringence		~0·011 Moderate 1st order	~0·028 Strong 2nd order	~0·010 Weak (often masked)	~0·015 Moderate Low 2nd order	~0·014 Moderate Low 2nd order	~0·022 Moderate Low 2nd order
Extinction angle ($\gamma \wedge L$)°	X Polars	0	14–21	3–15	0	10–15	10–21
Orientation	X Polars & Sensitive tint plate at 45°	Length slow Opposite to Crocidolite	Length slow Opposite to Crocidolite	Length fast Orange/yellow for fibre along slow direction§ Blue along fast	Length slow Opposite to Crocidolite	Length slow Opposite to Crocidolite	Length slow Opposite to Crocidolite
Sign of elongation		+	+	−	+	+	+
	R.I. of immersion liquid	1·550	1·670	1·700	1·605	1·640	1·605
		Matching wavelength, index and observed dispersion colour					
Dispersion staining (Central stop & polariser)	Fibre // to vibration direction of polar (‡)	530nm(γ) Magenta	412(γ),440(γ') Yellow, Yellow	604(α),590(α') Blue-magenta	395(γ) Yellow	515(γ),540(γ') Reddish-magenta	427(γ),460(γ') Yellow, Golden yellow
	Fibre ⊥ to vibration direction of polar	660(α),556(β) Blue-green, Magenta	600(α),484(β) Blue-magenta, Golden-magenta	555(β),519(γ) Magenta, Reddish-magenta	598(α),465(β) Blue-magenta, Golden yellow	658(α),578(β) Blue-green, Magenta	678(α),530(β) Blue-green, Reddish-magenta

* The mineralogy and chemical composition of the various types of asbestos have been discussed by McCrone[7].
† For sodium D line (λ 589·3nm).
‡ The dash (′) refers to a measurement along the length of a fibre, the undashed figure to a measurement in the extinction position.
§ Of sensitive tint plate.
// = Parallel and ⊥ = Perpendicular.

such as asbestos board or sheet, blocks, tiles, pipes, asbestos-cement compositions, and reinforced plastics. Fillers or binding materials may include calcium and sodium silicates, magnesium carbonate, cement, chalk, clays, diatomaceous earth, starch, etc.[5,6]. Other types of fibres may also be present[5], for example natural organic fibres (cellulose, jute, sisal, etc.), synthetic organic fibres, and inorganic fibres (glass, mineral wool). McCrone[7] has recently listed a large number of components that may be found in insulation.

Recommendations for the sampling of materials containing asbestos have been given by the Asbestosis Research Council[5], and the importance of obtaining a representative sample emphasised. Experience has indicated that the amount of material supplied for analysis may range from 0·1 g of fine grey powder to 1 kg or more of very heterogeneous material.

If the sample consists entirely of loose asbestos fibre, it is possible to proceed directly to the analysis. Otherwise it will be essential to clean and prepare the sample by

(a) Mechanical separation or treatment
(b) Chemical treatment
(c) Heat treatment

The simplest treatment, where possible, is mechanical picking with fine forceps from multiple points on the sample. Mechanical treatment described in the literature has involved wet sieving over 100 mesh to remove the fines from laggings, or drilling/filing to obtain a fine powder from board or sheet[5]. Ultrasonic dispersion in a methanol bath has also been recommended. Another possibility is wet grinding.

Chemical treatment may involve the use of weak or strong acids and/or alkali, or even autoclaving with strong NaOH[5].

Heat treatment may involve low-temperature (400°C) or high-temperature ashing[6]. Heat treatment above 400°C changes the optical characteristics.

The residue is usually dried before analysis and, if it is practically all fibre, its weight immediately gives an estimate of the original fibre content of the sample.

The methods of identification that have been used for the various types of asbestos include optical and electron microscopy, x-ray diffraction and infrared spectroscopy. Of these, optical microscopy is the most widely used method, for reasons of economy and speed. Table I gives a comparison of optical and other characteristics of the six different types of asbestos, the data having been co-ordinated from the literature[5–15].

The most useful techniques for routine examination and identification are incident light observation of the fibre morphology with a low-power, stereo-binocular microscope, followed by examination of the sign of elongation using crossed polars and a sensitive tint plate, and of the dispersion staining colours, all by transmitted light microscopy (× 100). For this purpose a polarising microscope is required, and it is particularly important to know or determine the vibration direction of the polariser, as some errors have crept into the literature of asbestos identification. This point is dealt with later in the experimental section. The sensitivity of these microscopical methods is considerably better than 1 p.p.m.

Purdy and Williams[15] have given useful data for the identification of non-asbestos silicate fibres. Man-made fibrous silicates include rock and slag wools, and glass fibre/wool, and are single glassy fibres which do not split longitudinally. Mineral wools are isotropic, of refractive index 1·43–1·48, with a characteristic brown colour, and they usually consist of a tangled mass of single fibres coated with globules of fused resin binder. Glass fibres are also isotropic, of refractive index 1·43–1·52, but are colourless. Both are > 4 μm in diameter, whereas asbestos fibrils are 0·1–1·0 μm in diameter.

For the identification of animal fibres, plant fibres and synthetic fibres that may be found in insulation, many aids are available[16–25]. Where mechanical separation is used, fillers can often be identified by optical crystallography and morphology[7].

Apparatus and Reagents

1. *Nylon sieve*, 0·5 mm mesh.
2. *Buchner funnel* (Preferably Hartley 3-section pattern).
3. *Conical filter flask* (500 ml) and filter pump.
4. *Whatman 9 cm filter papers*, Nos. 1 (medium fast) and 54 (fast, hardened).
5. *Low-power, stereo-binocular microscope* with incident lighting ($\times$ 10 to $\times$ 40).
6. *Polarising microscope* with sensitive tint plate, and rotating stage.
7. *McCrone dispersion staining objective.*
8. *Cargille refractive index liquids* with $n_D^{25} = 1{\cdot}550$, 1·605, 1·640, 1·670 and 1·700 (See Appendix).

Method

If the sample is fibrous and loose, accurately weigh about 0·5 g, transfer to a 400-ml beaker, add 100 ml of distilled water, then approximately 5 ml of concentrated HCl and boil gently. Effervescence indicates carbonates, and a yellow to green colouration the probable presence of iron. If the sample is very tangled, tease out into smaller bundles before weighing. If the sample is hard and compact, break off small pieces with clean pliers or side cutters, accurately weigh out about 0·5 g, wet grind to a homogeneous dispersion in a mortar with a little distilled water, and transfer quantitatively to a beaker before adding distilled water (to 100 ml) and 5 ml of concentrated HCl. *Any dusty operations should be conducted using an approved dust respirator or in a dust extraction cabinet or fume cupboard.*

Mark two No. 54 filter papers with the letter A, weigh against each other and write the tare weight on the heavier. Repeat with two No. 1 filter papers marked B. Assemble the Hartley funnel and pump, with the two A filters, the heavier on top, and place the Nylon sieve on top of the Hartley funnel. Filter the warm asbestos suspension successively through the Nylon sieve and Hartley funnel. This gives three fractions:

(1) Coarse fraction (On sieve)—Mainly asbestos fibre (but may include mineral wool, synthetic, animal or vegetable fibre and large pieces of hard grit).

(2) Acid-insoluble fraction ("A" filter)—Mainly filler plus a small amount of very fine fibre.

(3) Acid-soluble fraction (Filtrate)—Containing anions and cations from the filler.

Pour 50 ml of the filtrate into a 100-ml conical flask for subsequent qualitative analysis. Reverse-wash the Nylon sieve with distilled water and refilter the suspension through the sieve over the "A" filter. Wash the "A" filters with acetone and dry in an oven at 70°C. Re-assemble the Hartley funnel with the "B" filters, reverse-wash the sieve into a 400 ml beaker, wash the suspension into the funnel, wash the filter with acetone and dry in the oven.

While the filters are drying, test the filtrate for sulphates and phosphates, and for selected cations such as Fe, Al, Ca and Mg.

Weigh the oven-dry "B" filters against each other, subtract the tare weight, and calculate the approximate percentage of fibre in the original sample. If the coarse fraction contains visible hard grit, these particles should be removed if possible with forceps before weighing. If the sample contains animal, vegetable, or synthetic organic fibres, ignite the fibre below 400°C in a platinum dish to isolate the asbestos, and re-weigh. When rounding off the fibre percentage, it is better to round upward to compensate for the slight solubility of asbestos in dilute acid (see results).

Weigh the oven-dry "A" filters against each other, subtract the tare weight, and calculate the approximate percentage of acid-insoluble filler. If the B and A fractions consist entirely of fibre, the weights should be added to give the total fibre.

Note that in carrying out this method, very great care must be taken to clean the Nylon sieve between consecutive analyses and the sieve should then be examined at × 40 *magnification under the stereo-binocular microscope to detect adhering fibres before further use, as a precaution against contamination.*

The approximate nature of the results obtained by this method must of course be fully realised.

IDENTIFICATION OF THE A AND B FRACTIONS

Examine the fibre from the B fraction with a low-power, stereo-binocular microscope.

(a) If the fibres are whitish, curly, and of silk-like appearance, the fibre is probably Chrysotile. Mount in RI liquid 1·550.

(b) If the fibres are straight and white or creamy brown, the fibre is probably Amosite. Mount in RI liquid 1·670.

(c) If the fibres are slate blue in colour, the fibre is probably Crocidolite. Mount in RI liquid 1·700.

(d) Bear in mind the remoter possibility of finding Anthophyllite, Actinolite or Tremolite (See Table I).

(e) Bear in mind the possibility of mixtures of different types of asbestos, and of animal, vegetable or synthetic fibres. The latter three groups are readily distinguishable from asbestos fibres.

It is absolutely essential to search the filter very thoroughly for traces of blue asbestos mixed with white or brown asbestos, as only a few blue fibres may be present.

Transfer the slides to the polarising microscope, and identify the type of asbestos using crossed polars with the sensitive tint plate, by dispersion staining (central stop) and by observation of the extinction (see Table I). Also identify, as far as possible, the nature of the filler in the acid-insoluble fraction.

The analyst should be quite clear about the vibration direction of the polariser (lower polar) as this affects the colours seen in particular orientations. The vibration direction of the polariser can be determined by observation of the pleochroism of the biotite flakes in a mounted section of biotite-bearing granite; the colour is deepest (dark chocolate brown) when the cleavage lines are parallel to the vibration direction of the light[26].

Results and Discussion

The data reported by the analyst can, very simply, be the percentage of asbestos fibre in the sample and type. However, the scheme of analysis outlined above is made to yield much more detailed information such as:

Percentage of total fibre and types—mineral, animal, vegetable, synthetic.

Percentage of asbestos fibre and types—amosite, chrysotile, crocidolite etc.

Percentage of acid-insoluble filler and its nature—brown siliceous matter, crystalline material, diatomaceous earth, fly ash, minute woody fragments etc.

Percentage of acid-soluble filler and the ions present—Fe, Al, Ca, Mg; carbonates, sulphates, phosphates.

It must be remembered that acid treatment of the sample can lead to some dissolution of the asbestos present. Preliminary experiments with pure samples of asbestos showed that acid treatment with 2 per cent. HCl or 1 per cent. acetic acid gave recoveries in the range 88–90 per cent. for Chrysotile, and in the range 92–97 per cent. for Amosite and Crocidolite. Minimum acid treatment can be given by boiling the wet ground material with hot water, adding phenol red indicator, followed by drop-wise addition of 10 per cent. HCl until the pH is < 7; this was found to give recoveries > 95 per cent. for all types of asbestos.

Examination of over 160 samples of bulk asbestos has given an overall picture as shown in Table II.

TABLE II

ANALYSIS OF BULK ASBESTOS MATERIALS

ANALYSIS OF RESULTS ON "FIBROUS" FRACTIONS

Percentage of samples	Composition of fibrous fraction
65	Amosite, Chrysotile or mixture of these two
8	Contained Crocidolite
8	Amosite or Chrysotile, mixed with vegetable fibre
13	Entirely vegetable fibre
3	Entirely isotropic mineral fibre
1	Entirely grit

Care is necessary when mica is present as fibrous slivers may be found which can be "length slow" or "length fast" according to orientation, and the latter might at first examination be mistaken for crocidolite fragments.

Extreme care is needed if only 1 or 2 crocidolite fibres are found from 1 g of original material; a single fibre 10 μm long and 2 μm diameter would weigh $3{\cdot}2 \times 10^{-10}$ g representing $3{\cdot}2 \times 10^{-8}$ per cent. If the original material is heterogeneous, a second sample should be called for in case the blue fibres represent the "tip of the iceberg". If the material is homogeneous, the result could be genuine but insignificant, or the result could be due to accidental contamination. Further information about the origin and history of the sample should always be sought, and the situation seen in proper perspective. It has been found advisable always to repeat the analysis to confirm the presence of such minute traces of blue asbestos. The Asbestos Regulations (1969) require that 28 days' notice be given to the Factory Inspector if the removal of lagging containing any crocidolite is planned. The analyst must report minute traces of blue asbestos; the appropriate action is decided by the inspector.

Where the acid-insoluble fraction of the filler was concerned, brown siliceous matter and a small amount of very fine fibre were invariably present. These and other materials present are listed in Table III.

TABLE III

ANALYSIS OF BULK ASBESTOS MATERIALS

ANALYSIS OF RESULTS ON "ACID-INSOLUBLE" FRACTION

Percentage of samples	Material found
100	Brown siliceous matter and small amount of very fine fibre
30	Crystalline material
15	Diatomite
0·6	Fly ash

Table IV shows the frequencies with which various percentages of fibre and acid-insoluble filler occurred. Generally, percentages of fibre were in the range 0–20, with a mean value of 15 per cent., and percentages of acid-insoluble matters were in the range 0–50, with a mean value of 28 per cent.

TABLE IV

FREQUENCY OF OCCURRENCE OF VARIOUS PERCENTAGES OF FIBRE AND ACID-INSOLUBLES IN ASBESTOS MATERIALS

Range *per cent.*	Frequency of occurrence	
	Fibre	Acid-insoluble
0–10	66	16
10–20	16	22
20–30	3	18
30–40	4	23
40–50	3	11
50–60	2	4
60–70	1	3
70–80	2	2
80–90	2	1
90–100	1	0
Total	100	100

The ratio of total filler (acid-insoluble and soluble matter): fibre was found to vary from 0, for an all-fibre sample, to about 1000:1 for a sample consisting almost entirely of non-fibrous filler. The mean ratio of total filler: fibre was approximately 5·6.

In the acid-soluble fraction, calcium was found in 86 per cent. of the cases, iron and aluminium (not separated) in 54 per cent., and magnesium in 1 per cent. Some carbonate was present in 93 per cent. of the cases, sulphates in 39 per cent., and phosphates were generally absent.

It is emphasised that these results were from samples taken mainly from one area of London and a few other sites elsewhere, and may not be applicable to a wide area.

It should be pointed out that the percentage of fibre determined by the above methods is only an approximate figure, because the recoveries are not 100 per cent., and because a small amount of very fine fibre passes through the Nylon sieve along with the acid-insoluble particulates. However, the figures are sufficiently accurate to assist environmental health officers and contractors in making necessary decisions. It is suggested that figures above 10 per cent. be rounded to the nearest 5 per cent., those below 10 per cent. to the nearest 1 per cent.

Difficulties are occasionally encountered with the method. Fine glass fibre, especially if aged, tends to dissolve in hot acid solution. If the insulant is "cotton-wool like", and thought to be glass fibre, teased out fibres should be examined between crossed polars under the microscope to see whether they are isotropic. A flame test should also be applied; this causes glass fibre to melt into characteristic spherical shapes. If glass fibre is confirmed, the 0·5-g fibre sample should be dispersed in 100 ml of distilled water only before heating.

If the fibres are locked together with a tenacious binder (e.g. a hard resin), the sample should be mixed with an equal weight of fine acid-washed sand of mesh size finer than the fibre-retaining sieve (i.e. $< 0{\cdot}5$ mm). The sample should be thoroughly wet ground in a mortar, and then passed through the same procedure as before, except that the fibre-retaining sieve should be reverse-washed and the coarse fraction re-filtered, both three times, to ensure that all the sand passes through, leaving only loose fibre on the sieve.

TABLE V

LIQUIDS FOR IDENTIFICATION OF ASBESTOS FIBRES BY DISPERSION STAINING

Asbestos type	Immersion liquid	n_D^{20}	Dispersion staining*	
			//	⊥
Chrysotile	Ethyl cinnamate	1·558	Royal blue	Pale blue
Anthophyllite	Ethyl cinnamate: Cinnamaldehyde (25:75)	1·606	Golden yellow	Blue-magenta
Amosite	1-Bromonaphthalene: Methylene iodide (85:15)	1·670	Yellow	Magenta
Crocidolite	1-Bromonaphthalene: Methylene iodide (50:50)	1·699	Magenta	Magenta

* // = parallel and ⊥ = perpendicular to plane of vibration.

Appendix

V. Timbrell (*Proc. Int. Conf. Pneumoconiosis*, Johannesburg, 1969) has given some details of the liquids used for the identification of asbestos types by dispersion staining. The proportions in which these liquids should be mixed have been calculated, and the results are given in Table V for analysts who wish to make up their own mounting liquids.

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Book Reviews

A BIBLIOGRAPHY ON ETHYL ALCOHOL FOR FORENSIC SCIENCE AND MEDICINE AND THE LAW. By R. HOLLEYHEAD AND S. S. KIND. Forensic Science Society and Scottish Academic Press, 1980. Price £20. 443pp.

This is a collection of references to ethyl alcohol and is indexed according to Subject Index Terms; Subject; Author; Citation and Journal. The subject index is probably the most useful section to those Analysts dealing with blood or urine alcohol determinations and the defence of accused persons as drugs, inhalation, autopsies, health, ingestion are among the many subjects covered in this index.

Use of the references (probably about 10,000) should make tracking much easier by using the methods now available in the Royal Society of Chemistry library.

It is a most useful volume even if a little unwieldy as to size.

G. V. JAMES

First Supplement to MCCANCE AND WIDDOWSONS "THE COMPOSITION OF FOODS" (Amino Acids, Fatty Acids). By A. A. PAUL, D. SOUTHGATE AND J. RUSSELL. H.M.S.O., London, 1980. Price £8. 113 pp.

This is an invaluable supplement to the original reference book. The values supplied should not be confused with those quoted in the original as these are the values per 100 g of food and have been calculated from the original mg per g Nitrogen (in the case of amino acids) or g per 100 g total fatty acids in the original figures.

Thus calculations are made easier and the various figures are available in a more readily usable form than formerly.

Between the publication of the fourth edition of McCance & Widdowson in 1978 and this supplement, proper documentation of scombroid poisoning has taken place. It is known that this is a toxin which accumulates in the flesh of fish and the symptoms resemble those of histamine poisoning, although there is ample evidence that the poisoning is not an allergy. Histamine may be produced by removal of carbon dioxide from histidine.

Perusal of these tables will show that other fish, indeed many other comestibles, have similar levels of histidine to mackerel, which have been associated with most of the outbreaks of poisoning in the U.K., yet it is mainly with scombroid fish that outbreaks are associated and not dried eggs, grilled pork or lamb cutlets or parmsean cheese. These latter foods have higher histidine values and with the possible exception of skimmed milk cheese, have not been held responsible for any poisoning.

This may be a somewhat lengthy exposition of the one possible use of the tables but others will readily occur to other readers and it may thus be realised that the reviewer readily recommends this supplement, indeed is looking forward to others which are promised on the same lines.

G. V. JAMES

SEPARATION PROCEDURES IN INORGANIC ANALYSIS. By R. S. YOUNG. Charles Griffin & Co. Ltd., High Wycombe, Bucks. Price £23. 475 pp.

The book consists of 55 chapters each dealing with a separate element except for two chapters, one of which deals with the rare earths and the other with lithium, sodium and potassium. The index is a double column, 'five page' one.

Each chapter is completed with a list of references and the subject matter is treated in exactly the same way, i.e. Acid group; Hydrogen Sulphide group; Ammonia Hydroxide group; Ammonia Sulphide group; Ammonium Oxalate group; Ammonium Phosphate group; Remaining elements.

Each group deals with the use of a particular reagent for that element and what elements may be separated, and the conditions of separation. It is interesting to note the use of "Fire Assay" to separate the noble metals. This has for long been neglected. The chapter on the alkali metals does differ because these elements are left in the final filtrates from the other groups.

This plan works very well and becomes self explanatory. The text is free from errors, both technical and typographical, and is very well thought out and explained. This may well be on account of Dr Young's unique position and experience in Victoria (B.C.) with the Dept. of Mines and now as a Consulting Chemical Engineer which makes him eminently suited to write a book such as this. It can be thoroughly recommended to students and many others who will benefit from using it.

G. V. JAMES

MODERN POLAROGRAPHIC METHODS IN ANALYTICAL CHEMISTRY, By A. M. Bond. Marcel Dekker Inc. 1980. Price Sw. Fr. 155. 516 pp.

This book is one of a series of Monographs in Electro-analytical Chemistry and Electrochemistry, the author, Professor Bond, being located at Deakin University, Victoria, Australia.

An introductory chapter entitled The Renaissance of Polarography is followed by one on the basic principles of D.C. Polarography, Electrode Processes and faradaic and non-faradaic processes. Most of the remainder of the book is devoted to the different polarographic techniques available, the chapters being entitled:— Conventional D.C. Polarography, Limitations and Uses; Advances in D.C. Polarography, Linear Sweep Voltammetry and Related Techniques; Pulse Polarography; Sinusoidal Alternating Current Polarography; Miscellaneous Polarographic Methods; and Stripping Voltammetry. A closing chapter deals with Computers and Digital Data Processing in Polarography.

The publishers say that this is a book for the analytical chemist who is considering using polarography and wishes to ascertain which polarographic method

to choose and how to use it. In his foreword, the consulting editor of the series states that it is a book designed for the practising analyst, complete with examples and experimental details. However, while the theoretical basis of each of the techniques is discussed in considerable detail, the examples, which in the main are illustrative of the theoretical discussion, appear mostly to be confined to pure solutions, and experimental details are few and far between. Nowhere will one find working details for any of the methods. For these, one would presumably have to consult the references, which are appended to each of the chapters.

The book would undoubtedly be of considerable interest to a practising electroanalyst, and also to a postgraduate researcher wishing to study electroanalytical techniques. The practising Public Analyst, on the other hand, would be disappointed if he expected to find a ready answer to the question "What particular advantage does polarography have over the other methods in use"? let alone, "Which polarographic technique shall I use"?

The chapter on stripping voltammetry is of interest, in that this is a technique which has at various times during the last few years appeared to hold out considerable promise in terms of sensitive multi-element analysis. The author points out some of the practical problems associated with the technique, and gives a useful comparison of the analysis of some environmental samples using different versions of anodic stripping voltammetry.

The reviewer, however, is left with the impression that this is a book for the specialist, and will not, particularly in these times of financial stringency, be a worthwhile acquisition for the Public Analyst laboratory.

M. FINNIEAR