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LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT
of the
COUNTY ANALYST
for
THE YEAR 1972



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LANCASHIRE COUNTY COUNCIL

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of the
COUNTY ANALYST
for
THE YEAR 1972

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HEALTH COMMITTEE

(1973)

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The Vice-Chairman of the County Council:

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The Vice-Chairman of the Finance Committee:

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COUNTY ALDERMAN J. R. ASHTON

The Chairman of the School Health Sub-Committee:

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Lancashire Non-County Boroughs' Association:

C. E. DENWOOD, Esq.	Mrs. E. LANDLESS, J.P.
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Lancashire Urban District Councils' Association:

Mrs. E. N. KERSHAW	J. WESTWELL, Esq.
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Lancashire Executive Council:

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Lancashire Local Medical Committee:

Dr. H. C. PALIN

Old People's Voluntary Organisation:

Mrs. M. MURRAY	Mrs. W. ROBINSON
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LANCASHIRE COUNTY LABORATORY

STAFF 1973

County Analyst:

A. C. BUSHNELL, M.CHEM.A., F.R.I.C.

Deputy County Analyst:

J. COTTAM, B.SC., M.CHEM.A., F.R.I.C.

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Assistant Analysts:

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M. HAGUE, G.R.I.C.

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Mrs. C. M. MURRAY, A.R.I.C.

N. M. REGE, B.SC., B.PHARM., A.R.I.C.

D. RHODES, L.R.I.C.

Trainee Analysts:

Miss A. C. DAVIES

Mrs. P. D. GLADWELL

Mrs. C. KNIGHT

G. M. A. SIDAT, B.SC.

Clerical Staff:

H. HIGGINSON, A.C.I.S.

J. G. LANCEFIELD

Miss S. HARPLEY

Mrs. S. H. HODSON

Miss M. THOMAS

Laboratory Attendants:

Mrs. P. M. BROWN

Mrs. M. SAUNDERS

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST FOR THE YEAR 1972

To the Chairman and Members of the Lancashire County Council.

It is my pleasure and honour to present for your consideration this latest Annual Report and its description of work carried out by the Lancashire County Laboratory during the year 1972.

If one assumes that an effect of local government reorganisation in the year 1974 will be that all the local authority annual reports for 1973 will need to reach their respective committees before April, 1974, then this, my sixth report, will be the last full explanatory Analyst's Report to be made to the old County Council, and it could be the last Analyst's annual report in this traditional form. A report which must be available by March, 1974 is likely to consist of little more than tables.

The department acknowledges the Council's past interest and encouragement, and it would like to express appreciation of the indulgence through which, almost alone among the Counties, Lancashire has been enabled to issue an annual reminder of the existence of an analyst service in a world which must have come to think that 'Consumer Protection' began with "WHICH?", and then received its first official recognition in the passing of the Trade Descriptions Act.

Newly elected members of the new Council may wish to decide whether they would like to restore the present form of the report when conditions become normal again in 1975.

This report is, of course, the County Council's own report. The statutory reports made by the County Analyst by virtue of Section 99 of the Food & Drugs Act 1955 must be sent quarterly to the Ministry of Agriculture, Fisheries and Food. The explanatory memorandum of the former Ministry of Health, namely Memorandum 36/FOODS. PROCEDURE UNDER THE FOOD AND DRUGS ACT, (which was last revised in 1939), required that the Ministry should receive a copy of any annual report which might be prepared on Food and Drugs topics, but it did not demand that such annual reports should be compulsory. The memorandum also stated the nature of the information which should be given to the Ministry, and it invited the analysts' comments about all the samples examined. (The same memorandum was responsible, too, for unexpected detail such as the shape of the milk sample bottles to be used, for the printing in triplicate of the Food and Drugs Act sample labels, and

some other traditional curious items which have become associated with the administration of the Act.)

It is not practicable, when the quarterly reports are being prepared, to provide all the information which the Minister of Health requested, and the reason why Lancashire has encouraged the preparation of the Analyst's Annual Report has been so that the ultimate ends of the work of the Food and Drugs administration should be available each year for the Ministry.

The upsurge of the "Complaint" samples, which are provided by members of the public, has, since the original decision was made, brought about a change in the value of these annual reports as documents recording final action taken. Complaint samples are given the longer period of six months within which they may be brought to court, and some cases are adjourned until even later. So now, even by means of an Annual Report, it is not always possible (in a report which is to be presented within the following year) to inform the Ministry of the results of actions taken on all samples which have received adverse criticism up to the year's end; and within this present report, there may consequently be a few samples on which legal action may subsequently have been taken, even though your analyst has expressed surprise at there having been no further information available at the time when the draft was written. Any such samples will have reached court between the time of despatch of the manuscript and the report's final return from the printer.

Nevertheless an annual report does appear to be the one way by which a statement can be made that all anomalies were looked into.

As this report is the County Council's own, it is possible for the Analyst's comments to include a few words of explanation about some aspects of the work of a department which one or two Members have tended to regard as being 'mysterious'. In addition, such a great deal of what must be included is factual, and in an authority the size of Lancashire there are so many samples encountered which call for comment, that in some past reports a very informal approach has been adopted in order to help the reader to struggle through it all. The 1972 report is less frivolous than some of those, and with one eye on local government reorganisation it attempts to make some recommendations which may never be made elsewhere.

One of those recommendations is for a proper assessment to be made of the public analyst's role in the consumer protection services. The Trade Descriptions Act, The Medicines Act and the E.E.C. emphasis upon food law enforcement by factory inspection rather than by purchased commodity checking, are stressing the role of inspection at a time when it tends to be the laboratory problem which is the more acute. Talk of Agency Agreements threatens the laboratory with the possibility of inspection demands over which there is no control whatever. Under the guidance of the Medical Officer there has been a mechanism by which the laboratory could cut off routine sampling at times when samples appeared more rapidly than they could be analysed. The mechanism has not always been foolproof, but it existed. Since the large number of autonomous authorities

served by the Lancashire Laboratory forecasts to some extent the position which will obtain under Agency Agreements, the uneven loading of the laboratory in 1972 was a foretaste of what may be in store. In the first quarter of 1973, moreover, inspection needs and laboratory capacity again got out of phase. Decorators were refurbishing the laboratory and causing a great deal of disorganisation, so fewer samples were temporarily requested. At the quarter-end reckoning, however, it was found that 500 more samples than usual had been pushed into the department. County Laboratory is not staffed for uneven rates of sampling. On a pro rata basis its staffing is numerically only about two thirds that of any other full time laboratory—both in terms of County population and in terms of sample turnover. The establishment cannot expand because space is restricted, and the recommended rate of sampling can only be handled if samples appear at an even rate throughout the year. This adds up to a powerful case either for the retention of Food and Drugs sampling by the one central authority, or for a vastly increased allocation of finance to be made available so that the laboratory may be rehoused to handle more analyses. Our past experience as analysts for many authorities would probably enable us to give good service under Agency arrangements, but it would be very uncomfortable for us.

Having sounded a warning that without some consideration of unification, rather than fragmentation, the service provided by the laboratory may become impaired, the customary guide to the layout of the report may be given, as follows:—

Total samples examined	Page 5
New Legislation	Page 7
Part I Samples taken under the Food and Drugs Act 1955	Page 30
Food and Drugs Act—Milk	Page 43
Food and Drugs Act—Heat Treated Milk	Page 65
Food and Drugs Act—Other Foods	Page 68
Food and Drugs Act—Pesticide Residues in Food	Page 204
Food and Drugs Act—Drugs	Page 210
Part II The Fertilisers and Feeding Stuffs Act 1926	Page 225
Part III Waters	Page 234
Part IV Radioactive Pollution	Page 244
Part V Miscellaneous samples (including Trade Descriptions Act, Consumer Protection Act, Road Traffic Act, etc.)	Page 247

The total number of samples handled by the laboratory in 1972 was 12,232. Of these 3,637 were samples of milk and 4,199 samples were other foodstuffs taken under the Food and Drugs Act. The total number of unsatisfactory samples was 927 of which 221 were samples of milk.

There were 79 prosecutions instituted, 53 being on behalf of the County and twenty two being on behalf of other authorities. There were four “non-Food and Drugs” prosecutions of which only three had been heard at the completion of this manuscript, because of an adjournment.

Once again the enthusiasm of all those who have been associated with this work is gratefully acknowledged, and special words of thanks are due to Mr. J. Cottam and to Mr. M. S. Green for helping with the drafting of sections of the report, and to the office staff of the department, under the guidance of Mr. H. Higginson, for dealing with the tables and with much of the assembly of the document.

Special mention should also be made of the achievement in 1972 of Mr. Peter Moorcroft who successfully completed a long period of part-time study by gaining examination success in G.R.I.C. Part II, and that of Mrs. Christine Murray who in ten years with the department has successfully combined laboratory duties as an analyst with the domestic duties of a housewife and the exacting life of a part-time student, and has crowned all that effort by being awarded Associateship of the Royal Institute of Chemistry in October. It is a remarkable achievement and one on which she deserves the warmest congratulations.

I have the honour to be, Chairman, Ladies and Gentlemen,

Your obedient servant,

A. C. BUSHNELL,

County Analyst.

The County Laboratory,
County Hall,
PRESTON, PR1 8XN.
May, 1973.

TOTAL SAMPLES EXAMINED

During the year 1972, a total of 12,232 analyses and examinations were carried out in the County Laboratory. They are classified in the following table:—

Table 1

County Samples—

Food and Drugs Act (including 3,090 milks)	...	...	5,675
Appeal-to-Cow ...	...	...	16
Fertilisers and Feeding Stuffs Act, 1926	...	...	53

Food and Drugs Act samples from the following
Autonomous Food and Drugs Authorities:—

	(Population)	(Samples)	
Borough of Accrington	36,870	142	
County Borough of Barrow-in-Furness	63,998	195	
County Borough of Blackburn	101,672	198	
County Borough of Burnley	76,483	117	
Borough of Chorley	31,470	120	
Borough of Darwen	29,110	56	
Urban District of Huyton-with-Roby	67,200	157	
Urban District of Kirkby	60,170	94	
City of Lancaster	49,300	91	
Borough of Leigh	46,180	84	
Borough of Middleton	54,270	240	
Borough of Morecambe and Heysham	41,620	242	
Urban District of Newton-le-Willows	22,330	78	
County Borough of Preston	97,365	146	
County Borough of Southport	84,349	73	
County of Westmorland	72,724	128	
			2,161

Fertilisers and Feeding Stuffs Act, 1926—

County Borough of Blackburn	...	...	...	11
County Borough of Burnley	...	...	...	6
County Borough of Preston	...	...	...	8
County Borough of Southport	...	...	...	14
County of Westmorland	...	...	...	15

Other Samples (from all sources including the County)

Potable Waters	...	...	...	229
Other Waters and Effluents	...	...	...	114

Miscellaneous—

Milk Samples—Phosphatase Tests	...	...	...	1,267
Milk Samples—Methylene Blue Tests	...	...	...	1,381
Milk Samples—Turbidity Tests	...	...	...	459

Total number examined ... 12,232*

* Forty-five of these samples were examined for radio-activity

The total number of samples analysed in the year may be compared with the numbers analysed in 1971 by referring to table 2.

Table 2

Total number of Samples examined in 1971 and 1972

Year	County Food and Drugs	Other Authorities Food and Drugs	County Appeal-to-cow Samples	Other Authorities Appeal-to-cow Samples	Fertilisers and Feeding Stuff's Act	Waters and Effluents	Miscellaneous and Departmental	Total Phosphatase, Methylene Blue and Turbidity Tests	Total
1971	6337	2427	19	12	100	283	495	3152	12825
1972	5675	2161	16	Nil	107	343	823	3107	12232

NEW FOOD AND DRUGS LEGISLATION, OTHER LEGISLATION and DOCUMENTATION AFFECTING THE PUBLIC ANALYST, 1972

The biggest problem to emerge in 1972, in connection with food, was its sharply rising price toward the end of the year. The first indication of things to come may have occurred with eggs. The old Eggs Marketing Board had been disbanded, and an eggs mountain, which it had left behind, not unlike the infamous European butter mountain, began to release a larva flow of cheap eggs upon the market. The fall in prices which resulted put many egg producers out of business. In an effort to halt the likely loss of egg production, which sale of eggs at prices lower than production costs must eventually bring about, a government appointed Eggs Authority had to buy eighteen million eggs in 1972 in order to keep the price of eggs UP! Memories of this simple mechanism were to be revived over and over as 1972 entered into 1973. Those egg producers who did remain in business in 1972 had the satisfaction of seeing that the *Trade Descriptions (Origin Marking) (Eggs) Order, 1972*, (Statutory Instrument, 1972, No. 1041) required country of origin markings on all imported eggs from August, 1972. The two Indication of Origin Exemptions Directions (SI.1972 Nos. 1886 and 1887) however, made it unnecessary to mark pre-packed food bearing a United Kingdom name with an indication of the country of origin.

Milk

Europe had been trying to adjust its milk production by market manipulations of the price for cattle, but one result had been a dearth of beef cattle which became acute just as Britain entered the Common Market. The Meat and Livestock Commission had, as early in the year as June, accused British farmers of hoarding beef in readiness for the better prices which beef would fetch in Europe, and in East Anglia there were fears that milk production could cease altogether as farmers concentrated on producing beef for Europe to the detriment of milk production.

The milk industry in 1972 was facing up to changes imposed by European Milk Regulation 1411/71, which had been made in the previous year. Perhaps there were some people who before 1972 had understood what Harmonisation of Legislation meant, but it was not until 1972 that the majority of public analysts fully realised that the food trade had been wrangling since 1962 with procedures in which a Regulation would have the force of law throughout the Community, and a Directive would provide for the laws of the member states to be adjusted to bring eventual legislative harmonisation through the Community. Regulation 1411/71 provided for three grades of heat treated milk, one with a fat content of at least 3.5 per cent, a second with a fat content of between 1.5 per cent, and 1.8 per cent, and Skimmed milk would be milk with a fat content below 0.3 per cent. No minimum standard for milk solids other than fat would remain, but there would be a prohibition on the presence of extraneous water. Untreated milk would not be subject to the standardisation of fat content, so in any geographical areas where it was not possible by natural

means to achieve the prescribed standards there would be provision for the sale, as "Whole Milk", of milk of lower quality than was required by the standard. At the time of writing, there is still a possibility that this last provision may be achieved by retaining "Farm Gate Untreated" milk of the old regulations. Unfortunately Britain's milk industry felt unable to meet this regulation by 1973 so it took advantage of derogations which allowed it to put standardisation off in Britain until 1st January, 1976, at which time milk would also cease to be sold by the pint and instead would be sold by the smaller half litre.

Public Analysts suspect that central government may intend to scrap the public analyst service soon after local government reorganisation, and one reason for believing this is that information so seldom gets to the Analysts. A letter from the Ministry of Agriculture, Fisheries and Food, ref. MK 12818 and dated 29th December 1972, explained the points mentioned above very lucidly and it proposed changes in the Heat Treatment Regulations which would enable the skimmed varieties of heat treated milk to be accommodated by those Regulations. By asking the Ministry for a copy of that letter and its associated documents your analyst acquired a copy of it in March, 1973—long after the above notes had been written.

The Milk Marketing Board itself has had to consider very carefully how it stood in relation to the Community's monopoly laws. Britain had been buying cheap butter and cheap cheese from abroad, and in order to enable the home dairy industry to compete, the Milk Marketing Board had fixed a high price for liquid retailed milk in order to make manufacturing milk available at a price of only 2½p per gallon. No monopoly adjustment of that kind would be tolerated by the Community, so the Board had to consider what adjustments it needed to make in order to stay respectable, and it had to accept that the price of manufacturing milk would go up to 15p per gallon. Farmers who had been looking forward to an immediate increase in the price of manufacturing milk in 1973, however, had to wave their hopes of 1½p per gallon increase goodbye, and settle for ½p per gallon in the first period. Britain was promised until 1978 to bring butter and cheese prices up to European prices but the expected price differences were of the order of double the existing prices, and while industrialists built new cheese factories in order to benefit from the anticipated profits in English cheese, the British public had to face the prospect of following where Holland had led, and once the large stocks of butter laid in to ease the price transition, were used up, thereafter they were told that they would be eating a massively increased proportion of margarine in their diet.

The purely domestic documents concerning milk in 1972 were more prosaic. Circular FSH 1/72 listed cleaning agents approved for milk churns, etc. Circular FSH 3/72 referred to a general problem of chemical laboratories in a particular way. Thus a test which is as routine as the methylene blue test for the active bacteria content of milk, is greatly speeded when the reagents which are used do not need to be weighed, but can be added in tablet form. The chemical firm which had formerly supplied these reagents in this form had decided to withdraw the commodity, and the Ministry

issued the circular to tell users the name of the one remaining supplier. The effect of the accountants' efforts on industry not only makes everybody eat the same kind of breakfast food, travel in identical motor cars, live in little boxes made of tacky tacky and so on, but it makes the acquisition of rarely-used glassware and the other apparatus needed in specialist fields increasingly difficult.

Circular 4/72 was an explanatory leaflet connected with Statutory Instrument 1972 No. 1117. The proposals to amend the *Milk (Special Designation) Regulations* had appeared in May, but once again the Ministry had decided that public analysts would not be interested, and the local authority associations which *had* been circulated had not taken account of the oxygen-tent state of health of The Association of Public Analysts; so the information piled up somewhere in the distribution system. The amendment regulations themselves provided for the production of Ultra Heat Treated Milk by the direct injection of steam into the milk. Controls were laid down which were intended to ensure that the process would not become a licence to add water to milk, and to make sure that if any boiler water treatment chemicals were transferred accidentally to the milk they would not be actually toxic. The circular, leaflet 4/72, gave advice in retrospect when it had been realised that the new UHT process could be operated on an existing UHT licence, and there were no means for enforcing the controls (other than the general powers in the Food and Drugs Act) until the next licencing period came around. The leaflet did explain the process however, thus emphasising the importance of frequent inspection and the need for a complete understanding of the plant calibration procedure. 1972 also saw Messrs. Unigate trying to introduce a new milk product which, for all one knows, may be acceptable on the Continent, but in England infringed the Condensed Milk Regulations. The product was a twice concentrated milk sold in cartons, but, as with "Men Only", the public was evidently not ready for it in 1972, and the product had been withdrawn by the end of the year.

Bread, Flour, etc.

The Baking Industry was just as pessimistic about price rises which might follow EEC entry. They saw that there was to be a Flour Regulation under Article 43 of the Treaty of Rome in which the additives to be permitted in flour were thought likely to be limited to malt flour 1 %, legume flour 2 %, Ascorbic acid 0.0005 %, Soya lecithin 0.2 % and Enzyme products 0.2 %. Unlike continental breadmaking, British breadmaking has been rationalised into a massive industrial operation in which uniformity of raw materials has become absolutely essential, and a relatively wide range of additives has, in addition, been brought to the aid of the mechanical baker. It is an industry geared to the predictable composition of Canadian wheat. The European wheat, which itself may rise from a 1972 world price of around £30 per ton to perhaps as much as £120 per ton is not of constant composition. Its moisture, enzyme and protein contents are extremely variable, so industrial style baking will require constant adjustment based on analysis, with a great deal of fortification of flour with bean protein. The trade confidently forecasts that bread prices will double. In addition

however the weights will change with their inevitable hidden price rises. Instead of our existing familiar three weight categories, namely 10 ozs., 14 ozs. and 28 ozs., we shall face six categories (all expressed in grams but corresponding to 7 ozs., $8\frac{3}{4}$ ozs., $17\frac{2}{3}$ ozs., $26\frac{1}{2}$ ozs. and $32\frac{1}{4}$ ozs. The mysteries of dovetailing with the EEC were beginning to resolve themselves by the end of the year. EEC products which were intended for free trade within the Community and were expected to pass unchecked through Customs would have to comply with EEC regulations. Those which were sold within any particular country would have to comply with the country's own laws. If that is not the intention, then *The Bread and Flour (Amendment) Regulations*, 1972, which permitted more additives in flour just when the EEC was restricting the use of additives in flour, might have seemed incomprehensible. The amendment dealt mainly with added nutrients, but the improver, azodicarbonamide about which the Food Additives and Contaminants Committee had been half-hearted in 1968, was permitted to be used.

Similarly the sugar industry has issued warnings about increasing costs consequent upon the greater demand for sugar in the more prosperous Europe. In this, however, there may be seen to be a certain amount of hopping on the band-wagon. Sugar prices are as carefully manipulated as the price of diamonds, and some of the scientists who forecast a power crisis in less than a century have pointed to sugar as a possible renewable raw material for making fuel. Their arithmetic would not bear scrutiny if present sugar prices could not confidently be expected to adjust downwards.

In the context of all these remarks made by the food trade, the antics of Mrs. Peggy Fenner, M.P. could be recognised for the window dressing they really were, especially when the 1972 British prices for food were compared with the contemporary Continental prices, and bearing in mind that the two were expected to be comparable by 1978.

						Germany	Britain
Beef (1 lb)	...	...	...	...	...	£2	65p
Bread (1 lb)	...	...	...	...	...	15p	6p
Butter ($\frac{1}{2}$ lb)	...	...	...	...	...	20 $\frac{1}{2}$ p	10 $\frac{1}{2}$ p
Coffee (Instant) ($\frac{1}{4}$ lb)	...	...	...	...	...	90p	29p
Chicken (3 lbs)	...	...	...	...	...	75p	51p
Eggs ($\frac{1}{2}$ doz)	...	...	...	...	...	18p	9p
Flour (3 lbs)	...	...	...	...	...	21p	12 $\frac{1}{2}$ p
Frozen Peas ($\frac{1}{2}$ lb)	...	...	...	...	...	15p	8 $\frac{1}{2}$ p
Lamb (1 lb)	...	...	...	...	...	71p	41p
Margarine ($\frac{1}{2}$ lb)	...	...	...	...	...	10p	6p
Oranges ...	...	...	...	...	...	4 $\frac{1}{2}$ p	3p
Sugar (2 lbs)	...	...	...	...	...	16p	8 $\frac{1}{2}$ p

Colouring Regulations

The EEC Directives on food colours were made in the years 1965, 1967, 1968 and 1970. (The relevant numbers are 469, 653, 419 and 358).

The first sign that British legislation was going to be brought in line with those Directives was a Press Notice released on 28th September which summarised proposals for changes in the *Colouring Matter in Food Regulations* to bring the list of food colours permitted in the United Kingdom more in line with what is permitted in Europe. At present there are nineteen coal tar colours permitted in Europe whereas twenty-four are permitted in Britain, but the two lists have only ten colours in common. The proposals advocated the addition of Indanthrene Blue, Patent Blue V, Brilliant Blue FCF, Violet 6B, Quinoline Yellow and Acid Yellow to the general list for use in Britain, together with the immediate removal of Fast Red E, Red FB, Red 6B, Red 10B, Oil Yellow GG, Oil Yellow XP and Violet BNP. By 1978 there was a proposed further removal of Chocolate Brown FB, Chocolate Brown HT, Brown FK, Yellow 2G, Orange G, Orange RN and Red 2G. Three colours for limited use were also proposed. Thus Methyl Violet was to be added immediately for the specific purposes of stamping the skins of oranges and for marking raw and unprocessed meat, while Burnt Umber and Pigment Rubine were added for marking cheese rinds. The new list of colours seemed to number forty-seven colours in all but this was because it included in the one list all those items like vegetable dyes and metallic coatings which had been separated off, as for example in the section "Part III—Other Colours" in Schedule 1 to *The Colouring Matter in Food Regulations*, 1966. Ultramarine, Alkanet, Indigo, Persian Berry and Safflower appear to be no longer mentioned—unless they fit like Osage Orange under other rather subtle headings.

Although the EEC list which was issued in 1962 contained purity requirements for the seventeen water soluble dyes, no methods of analysis were prescribed. The purity criteria in the presently proposed regulations for Great Britain appear to be based upon the FAO/WHO note on food colours issued in 1963 and whose provisions are largely paralleled in British Standards and in U.S. specifications.

The materials called Diluents appear in another list, and include sodium carbonate, sugars, dextrans, sorbitol, beeswax, some organic acids, gelatine, pectin, alginates, sodium hydroxide and ammonium hydroxide.

Sterilisation of Food by Radiation

One Statutory Instrument which was issued in 1972 in the general food field, and which might be of interest, was *The Food (Control of Irradiation) (Amendment) Regulations*, 1972. The instrument revokes the amendment regulations of 1969 and replaces regulation 4 of the principal regulations with a provision for medical men to sterilise a special diet for a particular patient by using a high dose of radiation.

Food Labelling

Some tidying up of the Food labelling legislation occurred in 1972. Proposed Amendments to the Labelling of Food Regulations were circulated in May, 1972, and most of the proposals appeared virtually unaltered in *S.I. 1972, No. 1510, The Labelling of Food (Amendment) Regulations*, 1972, in October. In them "Flour Confectionery" was

re-defined so that products which included textured vegetable protein could be comprehensibly labelled. "Intoxicating liquor" was re-defined to make sure that it included all drinks for which an excise licence was required for wholesale sale. "Pre-packed" was re-defined to enable sandwiches to be wrapped. Adjectival use of food names in cases like "Blackberry and Apple Pie" were allowed for. The names of Fish Species were revised. Provision was made for a simpler labelling of dry mixes to which extra ingredients needed to be added. Mention (which seemed formerly to have been prohibited) of such a vitamin as folic acid or such a mineral as salt was allowed for, and claims about the presence of protein in a food were further restricted. Lists of ingredients which included edible fats or oils needed no longer to include the word 'edible'. Provision was made for a use of new labelling for soft drinks and changes to take effect from 1976 were made, to alter the manner of labelling soft drinks containers, and the vending machines from which some soft drinks are sold, so that soft drinks labelling was brought into line with the general requirements of Schedule 5 of the Labelling of Food Regulations.

It is interesting to note that in August, 1972, the Code of Advertising Practice Committee, in C.A.P. Bulletin No. 10, extended the limitations recommended for slimming advertisement. They took account both of requirements in the Labelling of Food Regulations and some criticisms which had been made in the magazine WHICH?

Lead

The only other actual regulation governing food to appear in 1972 was S.I. 1972, No. 1843, *The Lead in Food (Amendment) Regulations, 1972*. This document specified a limit of 0.5 part per million of lead in the reconstituted foods specially prepared for babies. The restriction followed the activities of the Working Party on the Monitoring of Foodstuffs for Heavy Metals, whose second report SURVEY OF LEAD IN FOOD revealed that the total diet contamination of food in the United Kingdom was 0.13 part per million (a result based on analyses of 3,000 samples). The report said that vegetables were slightly more contaminated, while milk and fats were slightly less so. The daily intake in the United Kingdom was said to be about 200 micro-grams. The working party thought a further 20 micro-grams might be ingested from beverages. They pointed out that only one-tenth of this intake was actually absorbed. In the course of the survey they had found that baby foods packed in cans had contained 0.24 part of lead in a million parts of the food . . . They had also found that water in areas of the Bristol Channel and in Cardigan Bay had higher contents of lead than elsewhere, but that fish other than shellfish caught in these districts contained no more lead than fish from other places. The report said that more information was being obtained on the lead content of crops grown on land which had been treated with sewage sludge, because sewage sludge frequently applied, represented a high metals loading on the soil. The conclusions of the report were that current environmental lead levels were having no harmful effects upon the population as a whole.

This was not the whole lead story for 1972 however. There were proposals circulated under the Consumer Protection Act which proposed

to limit the amounts of lead, soluble barium, soluble chromium, soluble cadmium and mercury in the paint used upon pencils, pens or brushes and in the substance of crayons. The proposals were not circulated to public analysts, but it has been said that the trade has calculated that the cost of doing the necessary testing under such regulations would be £3 for each metal determined on each colour. Later still in the year, news of further concern about lead in coloured materials which might get chewed by children, filtered through to Analyst's departments. A letter from the Department of Education and Science bearing the reference M30/33/03 referred to a previous memorandum 2/65, and stated that the Government Chemist had found quantities of lead in excess of the recommended 250 parts per million in some of the coloured gummed paper used in schools, and that the Department proposed to add gummed paper to a list of substances used in schools, on which there should be a limitation of lead content. Another Consumer Protection Statutory Instrument was issued at the end of 1972 to take effect from 1st April, 1973. This was Statutory Instrument 1972 No. 1957, *The Cooking Utensils (Safety) Regulations, 1972*. These say "No kitchen utensil, in which to cook food, shall be coated on any surface designed to come in contact with the food, with a tin or other metallic coating, which apart from any local contamination derived from solder forming part of the utensil, contains lead or any compound of lead, so that the proportion by weight of lead (calculated as the element Pb) exceeds 20 parts in 10,000 parts of that coating".

Medicines

The question of liability over medicines swept up into a hullabaloo again in 1972. To most peoples' astonishment the Thalidomide affair had not been settled even in ten long years, and the *Sunday Times* went crusading against The Distillers Company.

One good effect of the Thalidomide affair was The Medicines Act. The pharmacists had been calling for stricter control on medicines for many years, and Thalidomide brought it about. In 1972 the interim arrangements came to an end, and 1st September, 1972, was fixed as the date from which the sale, supply, import and export of medicinal products became fully covered by the licencing arrangements of the Medicines Act. The relevant documents which brought it all about were S.I. 1972 No. 717, *The Medicines (Closing Date for Applications for Licences of Right) Order, 1972*; S.I. 1972, No. 788, *The Medicines Act 1968 (Commencement No. 1) Order, 1972*, which brought Section 65 of the Act into force; S.I. 1972, No. 1198, *The Medicines (Termination of Transitional Exemptions) (No. 1, Order, 1972*; S.I. 1972, No. 1199, *The Medicines (Exemption from Licence), (Manufacture and Assembly Temporary Provisions) Order, 1972*; S.I. 1972) No. 1200, *The Medicines (Exemption from Licences) (Special Cases and Miscellaneous Provisions) Order, 1972*, which dealt mainly with non-commercial medicines for clinical trials; S.I. 1972, No. 201, *The Medicines (Applications for Product Licences and Clinical and Animal Test Certificates) (Amendment) Regulations, 1972*; S.I. 1972, No. 1225, *The Medicines Act 1968 (Commencement No. 2) Order, 1972*, which prohibited misleading claims about medicines; and S.I. 1972, No. 1226, *The Medicines (Standard*

Provisions for Licences and Certificates) (Amendment) Regulations, 1972. It may be argued that all these regulations are only of interest to people involved with medicinal products, but the list itself indicates how complicated a task it is to bring medicines under control, and in most respects this task was really the most important consumer protection legislation of the year.

A report of the B.P. Commission on its work in 1971 appeared in 1972. It explained that in the British Pharmacopoeia Addendum 1971 there were 58 new monographs and alterations to 79 existing ones, thus bringing the B.P. in line with Volume 1 of the European Pharmacopoeia. Three monographs in the Addendum had subsequently been modified. The report also said that it was planned to produce another Addendum before issue of the next B.P. in order to accommodate new thinking involving Levodopa and Pethidine hydrochloride, and proposed addition of preservative to Syrup B.P.

46 new approved names had been published (in accordance with the provisions of Section 100 of the Medicines Act) and a guide to their pronunciation had been prepared. The report mentioned how changes brought about by publication of Volume II of the European Pharmacopoeia had been brought into force in Britain, and how, because the European standards for Ergocalciferol had proved to be unsatisfactory, steps had been taken to re-instate the B.P. standards. It said that about 200 monographs were in the first two volumes of the European Pharmacopoeia, and although Volume III was in preparation the total number would remain far short of the 1,250 in the B.P., for a long time. In order to meet the publication schedule the new B.P. scheduled for 1973, would not yet contain all the changes which would give complete equivalence with the European Pharmacopoeia, but all changes had uniformity in mind, and, so far, had included use of the abbreviation 'g' for gram (now spelt gram and not gramme) and (perhaps because no-one now understands 'equivalents') milli-equivalents had been abandoned in favour of millimoles.

Drugs packaging would be required to bear an identifying manufacturing reference mark and all labelling was under review. The word Glucose was being promoted to take the place of Dextrose, the new B.P. would include notes about the plastic containers themselves, and recommendations for doses were being reviewed, as were methods of testing for drug availability in tablets. There was also a warning that more complex laboratory equipment would be needed than formerly.

It may not have been noticed that one of the Statutory Instruments which has been mentioned as part of the mechanism of introducing operation of the Medicines Act prohibited the misleading advertising or labelling of medicines. An absolutely new concept in the new legislation is a prohibition on Unauthorised Recommendations—in other words a medicine may only be promoted for the purpose which appears in the licence. So far however, no detailed instructions about the labelling of medicines have been issued.

Therapeutic Substances for Agriculture

The Therapeutic Substances (Supply of Antibiotics and Chemotherapeutic Substances for Agricultural Purposes) (Amendment) Regulations 1972—S.I. 1972 No. 190. These regulations further amend *The Therapeutic Substances (Supply of Antibiotics and Chemotherapeutic Substances for Agricultural Purposes) Regulations 1971*, by permitting the supply of feeding materials which contain virginiamycin up to a concentration level of 13 parts per million without prescription, for pork pigs, and for feeds containing flavomycin up to a level of 20 parts per million, without prescription, for calves. "Pork pigs" and "Calves" are defined. The amendment regulations also increase the amount of virginiamycin permitted in feed supplements to 20 parts per thousand. These constitute amendments to the table which appeared on page 35 of last year's Annual Report.

Poisons

The Poisons Act, 1972. One considerable change which is taking place in legislation relating to poisons is that whereas formerly all control took place at the point of sale, in future it will take place before the poisonous substances reach the shops. Similar early control was in the *Therapeutic Substances Act of 1956*. The *Medicines Act of 1968* will deal with medicinal poisons, and the *Poisons Act* will deal with non-medicinal poisons. The *Misuse of Drugs Act 1971* will come into force around June 1972 to replace all the *Dangerous Drugs Act* legislation and the *Drugs (Prevention of Misuse) Act* legislation. The framework for legislation will then be *The Medicines Act*, *The Poisons Act*, *The Misuse of Drugs Act* and the *Food and Drugs Act*. Under the *Poisons Act*, the advisory body called *The Poisons Board* will remain, and the list of substances regarded as 'Poisons' for the *Pharmacy and Poisons Act 1933* will continue to have effect. Although sale of poisons will be controlled, the *Local Authorities* will still be permitted to obtain poisons for the exercise of any of their statutory powers. Parts II and III of the *Pharmacy and Poisons Act* are repealed, as is *Schedule 2* to that Act. The *Poisons Act* will come into force when changes to be made by *Schedule 5 and 6* of the *Medicines Act* have been brought into operation under *Section 136* of that Act.

Poisonous Substances in Materials Used in Schools. The administrative memorandum 2/65 dated 1st February, 1965 was said, in a letter from the *Department of Education and Science*, ref. M30/33/03 and dated 15th December, 1972, to be under revision. The letter pointed out that coloured gummed paper was not mentioned in AM2/65 and that the *Government Chemist* had found that some orange, red, yellow, blue, brown and green papers had contained significant amounts of lead or chromium, and that in consequence coloured gummed paper would be added to the list of substances which already appeared in the appendix to AM2/65.

Reports on Food Matters

The Food Standards Committee Report on Vinegars followed up a discovery which was mentioned in paragraph 107 of the 1966 report on misleading descriptions, that there was confusion of nomenclature of

vinegars. The Food Standards Committee have now decided that vinegar should always be the product resulting from a double fermentation, first from sugar to alcohol, and then from alcohol to acetic acid. They recommended that *Malt Vinegar* should be the appropriate designation only for a product made from grain whose starch had been converted into sugar by the sole agency of diastase from malted barley, and they excluded additions of other sugar to the mash. In lists of ingredients on other foods all vinegars might be designated 'Vinegar', but otherwise, they said, the type of vinegar should always be specified. Thus "Grain Vinegar" should be the name for vinegar made from the grain whose starch had been hydrolysed by means other than with malt, "Spirit Vinegar" should be the name of vinegar derived from alcohol which had been distilled from the original fermentation (and was said to be made as a rule from molasses), and the name "Distilled Vinegar" should also bear the name of the kind of vinegar from which it had been distilled. In addition, names of flavours such as Tarragon or Garlic should be additional to the full designation of the type of vinegar originally used. Blended vinegars, they said, should indicate the types of vinegar which had been blended. The report recommended that regulations for vinegar should be made. An appendix showed analytical constants for different kinds of vinegar.

The Food Standards Committee Report on Offals in Meat Products did not receive the press notices one would have expected it to have. This report, (which began with a quotation from Hamlet) jolted public analysts into a first realisation that there was reason for the Labelling of Food Regulations' acceptance of the generic and unqualified name 'meat' in lists of ingredients. This acceptance was to allow for the use of offals, without further disclosure of their type, in certain prepacked meat products. The report grumbled about the use of words like 'fries', 'melts' and 'Vells' in *The Offals in Meat Products Order*, not only because it is hard to find anybody who knows what vells are, but because such names are applied to different anatomical parts in different parts of the country. The writers recommended that the anatomical names of the offals used should be employed in the writing of future regulations, and that a proper definition of "Meat" should be introduced, and that "Offal" should be defined as in the *Meat Inspection Regulations*, 1963, with modifications which would prevent fat and skin from being included in the definition of "Offal". The Report's own suggested definition depends upon a list of carcass parts (which appears in an Appendix—and still fails to identify "Vells"). There is a section of the report which describes current use of offals, and incidentally helps to explain why canned meat soups have such a strange taste. There is also an implied suggestion that inadequacies in *The Offals in Meat Products Order* 1953 caused no difficulties, because in the days of the order's issue meat distribution was almost all effected by small butcher businesses, and there was less competition than at present to persuade the public to consume garbage. The report notes however, that ancient recipes show that revolting food has been eaten in the past, presumably without causing ill effects, and that manufacturers can still be very persuasive about being left to play Titus Andronicus in the present day. The report therefore recommended two categories of offals—one which could be regarded essentially as being meat, and one which would include items which might only be used in

cooked meat product. Their "permitted list" of offals would include sweetbreads, and their offals for use only in a cooked state would include chicken necks.

The report recognised the importance of labels on modern foods, and it recommended that food labels should indicate the presence of offals. Where the offal was of the kind which should be cooked, the writers considered that the word "Offal" would be the appropriate word to use except perhaps when foods such as Haggis were being offered for sale, and purchasers would know perfectly well that offal had been used in the making. The definition of "Uncooked", they felt, should be changed so that offals used in meat products should at least have been rendered bacteriologically safe before sale.

The use of skin in uncooked sausage, they say, should be allowed, provided that the skin is pre-cooked and its presence is declared, but such skin should not count toward the statutory meat content of sausages. Sausage casings made from gut or from pre-treated cattle hide should also be permitted, but blood and blood plasma should be included only as an offal and should only be used when pre-cooked.

The report recommended that new regulations should be made.

The remaining reports on food matters may conveniently be taken in the order in which they appeared. *The Food Additives and Contaminants Committee Report on the Review of Liquid Freezants in Food* appeared in June. The review arose out of misgivings about the direct use upon food of such materials as dichloro difluoro methane for the purpose of freezing it. Advantages had been claimed for it in comparison with carbon dioxide and liquid nitrogen, but they amounted mainly to a marginal cost advantage. There was a recognised possibility that organo halogen compounds might be carried over into treated food, and that pesticide residues in the original foods might be dissolved and concentrated on to subsequent foods if such materials were recycled. The committee did not wish to restrict imports of food which had been processed in this way, so they called for further studies to be carried out. An interesting side issue to this is that in 1972 a related material, Bromo chloro difluoro methane, was being recommended as a fire extinguisher for use upon delicate electrical equipment such as computers. As with the gases mentioned, this last material will expand from the easily liquified state into a non combustible gas, with great absorption of heat, but it too has solvent properties and suspect decomposition products. It seems likely however that no hazards will be felt to be associated with such chemicals, but until more information is available the Report took a cautious view of their use upon food.

July brought the *Food Standards Committee Report on Date Marking of Food*. Everything said about this subject is deeply biased either in favour of cheaper food and the smaller distributor (in which case the plea is for restricted use of date stamps) or in favour of higher profits and the super-market (in which case the plea is for elaborate and apparently explicit date stamps). The fairest thing to do, therefore, is reproduce exactly the

Ministry's own excellent summary, which reads:— "The Committee recognises the right of the consumer to be able to purchase food in as fresh a condition as is technically possible and to know that he is doing so. It concludes that new legislation will be required to increase the protection of the consumer, to assist the retail trade and to aid in the enforcement of the law, and recommends that a comprehensive system of open date marking of prepacked foods should be introduced. Regulations should come into effect three years from now to allow a period for full discussion of the detailed proposals and the necessary changes in practices and packaging machinery. There would be a few exemptions such as prepacked fresh fruit and vegetables.

For the purposes of open date marking, foods would be divided into two main groups, *short-life foods* about which there has been most public concern and *long life foods*. *Short life-foods* would be those which the manufacturer considered should be sold within three months, taking into account the time needed by the purchaser to keep them at home. These foods would be required to show a "sell by" date conspicuously on the label where it could be seen readily by the purchaser and by the retailer. The marking would show the day, month and year in a prescribed form, e.g. "sell by 02 SEP 72". The date would assist in stock rotation and give reassurance to the consumer about the freshness of foods on display. Foods subjected to special processes, e.g., vacuum packing, could be marked with an "open by" date as an alternative to the "sell by" date.

For *long-life* foods the Committee recommends a date of manufacture or of pre-packing which could be used for stock rotation and which would show the age of individual packages. This date would be shown legibly anywhere on the label or container in a prescribed form representing the month and year.

The manufacturer, or the packer on the manufacturer's advice, would be responsible for choosing which date to apply.

The regulations would be made under the Food and Drugs Act and its general provisions would continue to apply fully to the condition of the food when sold. It would not be made an offence to sell food after a "sell by" date.

The report is most interesting however in that it contains fourteen appendices in which strange fragments of information are to be found. Possibly the most significant of these include the statement that supermarkets find open dating to be the most convenient marking for their relatively unskilled labour to use for stock control purposes, that the normal allocation of food life is 20 per cent for the supplier, 60 per cent for the retailer and 20 per cent for the purchaser, and finally that in the United States of America a survey had shown that although most shoppers took notice of date codes, hardly any understood them, and further, that only two per cent of those shoppers had ever made any attempt to find out what they meant.

In July the *Food Additives and Contaminants Committee Report on the Review of the Preservatives in Food Regulations*, 1962, appeared. This is an

eighty-nine page report which needs to be read carefully, because there is a tendency, encouraged by the Ministry, for public analysts to accept some of the recommendations of such a report in anticipation of regulations which may be expected to appear later along the lines of the report. Such anticipation may ignore the fact that traces of benzoic acid are not yet permitted in fruit yoghurt, nor is sulphur dioxide yet permitted in canned cauliflower, nor in dried hops, nor are tiny amounts of thiabendazole yet permitted in the skins of citrus fruit, even though all these are considered to be acceptable by the writers of the report.

The recommendations are summarised in two tables which occur on pages 44 and 48 of the report. They deal with definitions of 'preservative' and 'storage'—which the committee felt should be brought up to date—and the list of those substances which should not be considered to be 'preservative' is revised. The committee considered it desirable to specify that the wood used in food smoking processes should not have been treated in any way and they recommend that the term "Meat Cured" should replace the present term "Meat Pickled". They said that "Flavouring Syrup" should include the syrup from which ice lollies are made, "sugar" should be a word restricted to mean Sucrose, and "hydrolysed starch" should be referred to as Glucose Syrup.

The committee recommended that carry-over provisions should not apply to compounded foods for which specified maxima have already been allotted in the schedule, and it rejects applications for allowing preservatives in margarine and other fat products, in marinated or preserved fish, in saccharin solutions and in sauerkraut. Canned fruit was also considered not to need the addition of preservative. Sorbic acid should, they felt, be allowed in sweetened nut pastes, in prunes, wine and mead. Benzoic acid with the related methyl, ethyl and propyl hydroxy benzoates together with the sodium or potassium salts of all of them, should, it was considered, be interchangeable, but the esters of ortho phenyl phenol should not be allowed in food.

The report suggests that funds should be made available for research into the effects of nitrite and nitrate in food, and the research in progress should be co-ordinated. There should be no extension of use of these salts, and efforts to eliminate or reduce their use should lead to the provision of new limits by 1974.

Committee members sympathised with the confusion which had arisen over Glucose Drinks which had contained the regulation 23·5 pounds of glucose syrup per ten gallons, and thus had seemed to qualify for the higher limits for sulphur dioxide and benzoic acid which apply to drinks containing $23\frac{1}{2}$ per cent of glucose, until it was realised that $23\frac{1}{2}$ lbs. of glucose syrup contained only 18·8 lbs. of sugars, so that such drinks were really in the category where smaller allowances of the two preservatives applied. The members recommended that the higher limits should apply to such drinks. They were less indulgent however about desiccated coconut, which they considered to need no allowance for sulphur dioxide.

The committee's view was that no amendments to the Preservative Regulations, in order to accommodate fumigation in food storage premises, were necessary, and they saw no reason for making regulations to deal with the waxing of apples. They approved extended use of benzoates in diabetic jams and similar low sugar preserves, in tomato pulp and in Glace fruit and they approved their use for preserving the enzymes used in beer primings, finings, foam stabilisers and haze preventing materials. They approved methyl para hydroxy benzoate in whole cooked beetroots, the use of carbon dioxide in sealed packets of bread, and use of sulphur dioxide in some vinegars, grape juice concentrates intended for home wine making, in french mustard, fruit yoghurt, beer finings and dried hops sold by retail.

Some proposed specifications for food preservatives are listed in an appendix, and two reports, one of the Pharmacology Sub-committee, and one of the Antibiotics Panel, are included in annexes to the main report and are intended to indicate the bases for some of the conclusions in the main report.

The report has received some very strong criticism, mainly because it had considered only the representations of people who wished to add preservatives to our diet and had thus given way to an unrealised bias which had already caused an increase in the number of foods permitted to contain preservative, from seventeen in 1925 to fifty-seven in 1962, many of the new uses being for foods which previously had been commercially satisfactory even before they had recourse to the use of preservatives. Those people who apply the terms Fascist or Nazi to any system of government in which big business has the only effective voice may see in this report further cause to wonder why the slaughter of 1939-1945 ever took place, because the Committee has not, in this report, succeeded in convincing the reader that the old criterion of 'need' applied to the thirty new uses of preservatives which have been proposed.

No mention was made of the EEC Directives on preservatives in food which have appeared at almost yearly intervals since 1964. The relevant documents are 60/54, 65/66, 66/722, 67/428, 68/420, 70/359, 71/160 and 72/2. In addition there is an EEC Directive on Antioxidants. This is number 70/357. There are, up to the present time no fewer than forty-two volumes of EEC Regulations. It is doubtful whether many local authorities hold copies of them even in their library departments.

In September the Food Additives and Contaminants Committee produced another document, this one being a *Supplementary Report on the Review of the Emulsifiers and Stabilisers in Food Regulations*. The report was supplementing the major report on the subject, which was published in 1970, and it considered representations which had been made after the publication of the 1970 report in the light of further advice received from the Pharmacology Sub-committee.

The first recommendation was that the existing exemption for starches (whether modified or not) should continue to apply for the time being, since

the committee would like to take account of an awaited EEC Directive on this subject before making any recommendations.

Next they proposed lifting the former restrictions in the use of sorbitan and polyoxyethylene sorbitan esters of fatty acids, and dioctyl sodium sulpho succinate surfactants. They also agreed that the use of Citroglycerides in bread is justified and that the sodium and calcium salts of stearoyl 2 lactic acid may be needed in high protein bread. Propylene glycol esters of fatty acids and of lactic acid are also now considered to be acceptable, together with sucrose esters of fatty acids and sucro-glycerides. They further accepted that polyglycerol esters of dimerised fatty acids of soya bean oil might be used in tin greasing emulsions—provided that the carry over to bread was not greater than 20 parts per million. They confirmed their earlier opinion that not more than 50 parts per million of oxidatively polymerised soya bean oils should be carried over to food when that material had been used in tin greasing emulsions.

Polyoxyethylene (20) sorbitan tri stearate and the mono oleate and polyglycerol esters of poly-condensed fatty acids of castor oil were also considered to be acceptable.

The newly considered Furcelleran, which resembles the gelling agent Agar, and Xanthan gum are also recommended to be added to the list of edible gums.

Sodium lauryl sulphate was not considered to be suitable for food use.

Specifications for the recommended materials were attached to the report and so was the pharmacology sub-committee report on which the new decisions were based.

Other Press Notices

Press Notices issued from time to time during the year gave warning of further activities of the committee, thus on 24th April the Food Additives and Contaminants Committee announced a forthcoming review of the *Mineral Hydrocarbons in Food Regulations*, 1966, since they had been asked to advise the Food Standards Committee on the implications in the production for human consumption of novel protein materials derived from the growth of yeasts on hydrocarbon substrates. Then on 18th May the same committee had found itself obliged to announce a forthcoming full review of the *Antioxidant in Food Regulations*, 1966, since the EEC Directive on the use of Antioxidants which had been issued on 13th July, 1970, listed the antioxidants which were to be permitted in the Community, but did not control the foods in which they might be used. On 24th August it was announced that the Minister had asked the Food Standards Committee to review existing regulations on the composition of Soft Drinks—again because the EEC Draft Directive on Soft Drinks, "Nectars" and Fruit Juices differed in some important ways from British Regulations. For example the use of saccharin in soft drinks will need to be considered again. Finally, in October it was announced that the Food Standards

Committee would be carrying out a three stage review of yoghurt, other cultured milk, cream and milk desserts. It was to begin by considering yoghurt with special reference to classification by fat content, fruit content, flavouring, additives labelling and heat treatment. Subsequently it expected to consider cultured milks, cream desserts which are ready to eat and whose main ingredient is derived from cream or milk. The large increase expected in the price of manufacturing milk may however wipe the market clean of all these frivolities before the committee gets to grips with its problems.

Pollution

Environmental Pollution seems to have become the topic which, in the 1970's, may replace Freudian sex as the quick test of the value of compulsory higher education. Freud said that if one *subconsciously* repressed a very strong emotion it might erupt in harmful ways. This became converted into a belief that if anybody exercised any kind of self control then harm would result . . . There have been only two philosophical conclusions to be drawn from the application of Freud's misunderstood philosophy. One was summed up by Flanders and Swann in the immortal lines: "The higher the brow, The harder they fall . . . for Pee, Po, Belly, Bum, Drawers". The other is the disclosure in 1972 that the only people who can tell when somebody is mentally ill is somebody else who is mentally ill. No doubt a lot of good has been generated by the disregard of the pronouncements of former erroneous philosophies while mankind persued the sex one, and no doubt good will result from the present universal acceptance of errors about pollution, which is not to say that a consensus of opinion produces the right answers. The *Second Report of the Royal Commission on Environmental Pollution* was only eight pages long but it immediately gave rise to *The Deposit of Poisonous Waste Act*. The *Third Report of the Royal Commission on Environmental Pollution*, together with a minority report and appendices, ran to one hundred and twenty-eight pages. This third report dealt with the pollution of tidal estuaries, and it made some twenty-seven recommendations. The minority report stated a case for assessing the profit likely to accrue from control of waste discharge and to work out a scheme for charging industry a tariff for discharging waste. This is an attractive idea. Roll on the day when an assessment of the proportion of the cost of the roads it uses is added into the purchase cost of every motor vehicle. Why should taxes subsidise the motor manufacturer? The gulf which exists between the desirable and the practically attainable is also indicated in a Warren Springs Laboratory booklet called, "*Oil Pollution of the Sea and Shore*". It should be read alongside a children's book of 1972 called "The Lorax" by Dr. Seuss (Collins) just as a reminder of how complex the pollution reality is when compared with the child-like simplicity with which the topic is usually viewed.

The Deposit of Poisonous Waste Act, 1972, is a little Act, running to only seven pages, but it puzzled people a great deal when it was enacted, and undoubtedly one effect which it had, was to bring home to many people how very responsibly the greater part of industry has dealt with waste problems in the past.

The important parts of the Act are Section 1 (1), Section 1 (5), and Sections, 3, 4 and 6. These say: 1 (1) no persons shall deposit waste on land, or cause or permit waste to be deposited on land where the waste is of a kind which is poisonous, noxious or polluting, and its presence on the land is liable to give rise to an environmental hazard. 1 (5) says that anyone guilty of contravening the abovementioned prohibition is liable to a fine of £400 or six months imprisonment on summary conviction, or up to five years imprisonment or an unlimited fine on conviction on indictment. Section 3 stated that waste to which the Act applies must not be removed from the premises or deposited on land until the appropriate authorities have been given information about the locations, the nature, the chemical composition of the waste, the quantity, and the name of the remover. Section 4 lists the obligations of the tip operators, who must tell the authorities the location of the tip, the nature and composition of the waste, the quantities, who delivered the waste, who issued the NOTICE under Section 3 and where the waste originated. Section 6 makes it clear that everybody concerned with a waste is liable to prosecution if the notification procedures are neglected.

The authorities to be notified are, for waste affecting land, (and therefore constituting hazards to animals, plants or humans), the local authorities; and for wastes affecting water, the River Authorities. As in the case of notification of movement of radioactive waste, there seems to be no action required of the local authorities—indeed—they are not even obliged to check the composition of such wastes. The onus is upon the producer to say what it is . . . although in fact some local authorities do have analytical checks performed from time to time to ensure that wastes submitted as exempt wastes—as indicated in the schedule to *S.I. 1972 No. 1017, The Deposit of Poisonous Waste (Notification of Removal of Deposit) Regulations, 1972*, really are what they are stated to be.

Were they not, as owners of tips, the local authorities themselves might in some cases be liable to fine for failing to notify the River Authorities about wastes which might transfer toxic matter to rivers.

There are one or two sites (in Essex for example) about which the River Authorities have said that there is no hazard to water supplies—but, for the greater part, both private and local authority tip owners may refuse a particular waste. The Act itself, however, says nothing positive. Nothing in the Act enables anybody to tell a firm which contracts to handle waste that it may not take it. The Act merely says that the contractor may not dispose of the waste in a particular way. Equally, there is no obligation upon anybody to say how a waste should be dealt with. Once it became clear that this Act was applying pressure to the people who knew most about a waste—namely the owners—to get it into a safe state before they moved it, the legislation seemed far less fearsome. In the second reading of the bill Lord Sandford had said: “The guiding principle is that it should be for the manufacturer to accept the responsibility for ascertaining what is likely to cause environmental hazard in waste”. To this day however, some firms feel uneasy about the need to state the nature and chemical composition of the waste. They argue that in some circumstances they do not

know the nature of waste materials left over from a particular process. The Secretary of State for the Environment is clearly unwilling to allow this to be a let-out for a manufacturer, so the only way for a local authority to avoid difficulty with this requirement is to be sure that it obtains all the information necessary from the first owner of the waste. On the other hand—if a local authority makes waste disposal too difficult, as things are, it may increase the possibility of having difficult materials simply thrown into its own sewers. A positive approach was made by the Institution of Chemical Engineers by the publication of its booklet "*A Provisional Code of Practice for Disposal of Waste*".

New proposals to combat Water Pollution were also enumerated in a Department of the Environmental circular, Circular No. 10/72 which listed the main recommendations of a Working Party on Sewage Disposal. To help with analysis problems, another circular, Circular No. 112/72 drew attention to a new Stationery Office Publication "*Analysis of Raw, Potable and Waste Waters*" which supersedes "*Chemical Analysis as Applied to Sewage and Sewage Effluents*", "*Recommended Methods of Analysis of Trade Effluents*" and "*Approved Methods for Physical and Chemical Examination of Water*".

It is rather astonishing, in view of the readiness of various officers of a local authority to apply for information to its Analyst, that so little information is automatically fed into an Analyst's Department. No doubt the police have full instructions on what to do if a chemical spill occurs on a public road, but if any Analyst's Department is lucky enough to possess a folder of *Transport Emergency Cards* (issued by the Chemical Industries Association at 93 Albert Embankment, London, S.E.1), it will be because it has paid for them in connection with some Civil Defence commitment—not because the authority has drawn the analyst into any general scheme under which it has an obligation. It is possible for an analyst to be named as a first stage assistance contact under "*National Arrangements for Incidents Involving Radioactivity*" and to know nothing about it—yet local authorities have an obligation under the scheme. Similarly it is doubtful whether any laboratories possess Department of Employment H.M. Factory Inspectorate Technical Data Notes on materials such as mercury, or even to know whether they ought to hold booklets like *D.E. Code of Practice for Reducing the Exposure of Employed Persons to Noise*.

The Future

. . . Questions like this will probably never be resolved until the Reorganisation considerations eventually get around to trying to decide what a local authority scientific department is meant to do. It is all very well to keep sweeping the question into the background just because some inspectors find it convenient to take a sample to someone who can be relied on to make a test of a particular kind for as small a sum as the N.J.C. can dictate, but we are finding separate laboratories appearing for water examination, others for environmental matters such as land reclamation, yet others for fuel analyses, or for examination of road construction materials, and then on top of this there is a whole uncertain area of where

advice should be sought about questions of radiation hazard, waste disposal hazard and so on. How many separate laboratories and advisers are the authorities hoping to hide away—simply because they will not face this question of establishing one full time scientific department for each major authority?

The public analysts laboratories themselves may all need considerable modification if the report of a committee presented to Parliament in July, 1972, becomes law. This is the Robens report on *Safety and Health at Work*. Decisions on the report are probably awaiting clarification of EEC law. Remotely allied to this concept, was the new Act called *The Employment Medical Advisory Service Act*, 1972, which set up the Employment Medical Advisory Service. This service has made one of its early activities take the form of an interest in activities associated with the investigation of working environments including a monitoring of atmospheric lead in lead factories. The Act will not apply to working conditions in the local authorities' own laboratories.

The analysts are bound to feel concern that in addition to obtaining qualifications in general chemistry and in the special field of Food, Drugs and Water there is a growing tendency for the student-starved science departments of universities to imply that special qualifications may be needed for water analysis, sewage analysis, environmental studies and so on. *The Local Government Act*, 1972, does not mention public analysts except that it deletes Section 89 (3) of the Food and Drugs Act, 1955, (which required approval of the Minister of Agriculture, Fisheries and Food for the appointment of a public analyst), and it also deletes Section 129 of the same Act (which established public analysts as officers of the authorities to which they were appointed, for purposes of compensation for loss or diminution of office). Sections 83 and 84 of the Food and Drugs Act are replaced by Section 198 of the Local Government Act, and this section establishes that County Councils shall be the Food and Drugs Authorities (except in Wales and London, where District and Boroughs will undertake this function under certain circumstances). Other changes effected by the Act are removal of reference to Medical Officer of Health (both in the Food and Drugs Act and in public health measures) and transfer of power to grant certain milk licences, from County Councils to Food and Drugs Authorities. The Weights and Measures provisions replace Sections 34, 35 and 47 of the Weights and Measures Act, and in Section 197 of the 1972 Act there is special provision for Weights and Measures Inspectors to give advice to consumers. Other parts of the Food and Drugs Act, namely those in Sections 70, 73, 75 and 78, which relate to slaughterhouses, are taken over by the *Agriculture (Miscellaneous Provisions) Act*, 1972. Any person wishing for a quick comprehensible run down on Local Government Reorganisation should take a jummy to 8 Harewood Road, London, NW1 6SQ., and acquire a copy of the NALGO Information Bulletin 7/72. The number suggests that there were at least six other Information Bulletins in 1972. If they were all as good as number 7 then they should have had wider circulation. Only in this booklet does a fairly clear idea of Agency Agreements appear (on page 12) and a sort of light dawn on the functions of Food and Drugs Authorities after reorganisation (on page 21).

From the Public Analysts point of view a minor change affecting his work came with the transfer of the statement of the limit for the alcohol content of a motorist's blood from the *Road Safety Act*, 1967, to *The Road Traffic Act*, 1972. Section 10 (7) specifies that an Authorised Analyst for the purposes of the Act is one holding the qualifications appropriate to holding appointment as a public analyst, or a person authorised by the Secretary of State; but the Home Office in a letter, Reference TRA/67 112/3/12, pressed for an additional assurance that micro-quantities of blood could be analysed.

It probably sounds as if these remarks are a voice crying in the wilderness for assurance of recognition after reorganisation. If there is an element of self preservation in these remarks it is not without cause. The concern of medical men about their five year course of study not being considered adequate in Europe (where a seven year course is required), the concern of pharmacists about professional dilution to the point where their knowledge of pharmacy becomes a mere eccentricity (comparable with a collector's mania for railway engine numbers), the alarm of work's managers in pharmaceutical manufacture about a European insistence upon a pharmaceutical degree for such a post, has its parallels in public analysing.

We thus seem to be facing a world in which everything is being made to change at once. Industry has been concerned for some time to find that it seems able to influence decisions in Europe only through the qualified voting system of the Council of Ministers, by means of decisions made in the Economic and Social Committee where the United Kingdom has only 24 votes in a total of 232. The members of that Committee are not available for direct instruction but are at present subject to the clamourings of over 400 pressure groups. As far as the public analyst can discover, somewhere among those 400 trade associations, the Ministry of Agriculture, Fisheries and Food may be putting in an occasional word about enforcement arrangements for food standards—but the analysts have been absolutely unable to learn, either through the Association of Public Analysts or through the Ministry, whether there *are* any enforcement laboratories for foodstuffs in Europe, or whether the British statutory qualifications for this work will be considered adequate in Europe. We are therefore enjoying a taste of how the social groups in backward lands must have felt when the invading white man first moved in with alien systems of establishing pecking order and with unfamiliar notions of justice.

Perhaps the only people who will survive will be those whose minds have not congealed around the arbitrary initiation rites of our present education system. The useless nature of much that we learn does not bear thinking about. It remains to be seen whether Europe will require a change from one pattern of useless jargon to another, or whether the Unions' insistence upon the abolition of merit increments will make education redundant. It is a very interesting time in which to be living.

Summary *Milk*

SI 1972 No. 1117

The Milk (Special Designation) Amendment Regulations, 1972

(Circulars)

FSH.1/72	Approved Chemical Agents
FSH.3/72	Supplies of Methylene Blue Tablets
FSH.4/72	Special Designation (Amendment) Regulations

Food and Drugs

SI 1972 No. 1391	The Bread and Flour (Amendment) Regulations, 1972
SI 1972 No. 205	The Food (Control of Irradiation) Regulations, 1972
SI 1972 No. 1510	The Labelling of Food (Amendment) Regulations, 1972
SI 1972 No. 1843	The Lead in Food (Amendment) Regulations, 1972
SI 1972 No. 1957	The Cooking Utensils (Safety) Regulations, 1972

Medicines

SI 1972 No. 717	The Medicines (Closing date for applications for Licences of Right) Order 1972
SI 1972 No. 788	The Medicines Act (Commencement No. 1) Order, 1972
SI 1972 No. 1225	The Medicines Act (Commencement No. 2) Order, 1972
SI 1972 No. 1198	The Medicines (Termination of Transitional Exemptions) (No. 1) Order, 1972
SI 1972 No. 1199	The Medicines (Exemption from Licences) (Manufacture and Assembly Temporary Provisions) Order, 1972
SI 1972 No. 1200	The Medicines (Exemption from Licences) (Special Cases and Miscellaneous Provisions) Order, 1972
SI 1972 No. 201	The Medicines (Applications for Product Licences and Clinical and Animal Test Certificates) (Amendment) Regulations, 1972
SI 1972 No. 1226	The Medicines (Standard Provisions for Licences and Certificates) (Amendment) Regulations, 1972

Therapeutic Substances

SI 1972 No. 190	The Therapeutic Substances (Supply of Antibiotics and Chemotherapeutic Substances for Agricultural Purposes (Amendment) Regulations, 1972
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- SI 1972 No. 1687 The Therapeutic Substances (Supply of Antibiotics and Chemotherapeutic Substances for Agricultural Purposes (Amendment No. 2) Regulations, 1972
- SI 1972 No. 1315 The Therapeutic Substances (Sulphanilamide Derivatives) (Supply of Eye Drops and Eye Ointments) Regulations, 1972

Poisons

- The Poisons Act, 1972
- SI 1972 No. 1938 The Poisons List
- SI 1972 No. 1939 The Poisons Rules
- Department of the Environment and Science letter M30/33/03 Poisonous Substances in Materials Used in Schools

Public Health

- The Deposit of Poisonous Waste Act, 1972
- SI 1972 No. 1017 The Deposit of Poisonous Waste (Notification of Removal of Deposit) Regulations 1972
- SI 1972 No. 1016 The Deposit of Poisonous Waste (Commencement) Order, 1972

Agriculture

- The Agriculture (Miscellaneous Provisions) Act, 1972
- SI 1972 No. 1260 The Agriculture (Miscellaneous Provisions) Act, 1972 (Commencement) Order, 1972
- SI 1972 No. 1413 The Diseases of Animals (Approved Disinfectants) Order, 1972

Trade Descriptions

- SI 1972 No. 1041 The Trade Descriptions (Origin Marking) (Eggs) Order, 1972
- SI 1972 No. 1886 The Trade Descriptions (Indication of Origin) (Exemptions No. 1) Directions, 1972
- SI 1972 No. 1887 The Trades Descriptions (Indication of Origin) (Exemptions No. 2) Directions, 1972

Road Safety

- The Road Traffic Act, 1972

Reports

Vinegars

Offals in Meat Products

Liquid Freezants in Food

Date Marking of Food

Review of Preservatives in Food Regulations

Emulsifiers and Stabilisers (Supplementary)

White Paper

Metrication

PART I

SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACT, 1955

*Particulars of Samples of Food and Drugs submitted by County
Sampling Officers.*

In Table 3 there is a list of all the articles of food and drugs which were submitted during the year 1972 from the County of Lancaster, together with the numbers of samples found to be adulterated.

*Table 3
Samples examined under the Food and Drugs Act during 1972*

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Alcoholic Drinks:—								
Beer		33		33		1		1
Beer Making Ingredients...		5		5				
Brandy	16			16				
Cider		1		1				
Gin	13	1		14				
Rum	14	1		15		1		1
Stout		1		1				
Vodka	2			2				
Whisky	22	1		23				
Wine	1	15		16		5		5
Wine Aperitif		2		2		1		1
Wine and Malt Whisky ...		2		2				
Beverages:—								
Chocolate, Drinking ...		4		4		1		1
Cocoa		1		1				
Coffee		4		4				
Coffee Extract, dry ...		6		6		1		1
Coffee and Chicory ...		1		1				
Coffee and Chicory Essence liquid, sweetened ...		3		3		1		1
Malt, Milk and Cocoa Beverage		6		6				
Milk, Malted		3		3				
Tea		21		21				
Tea Mixture, dry, sweet- ened		1		1				
Cereal Products:—								
Arrowroot		2		2				
Baking Powder		6		6				
Biscuits		29		29		6		6
Blancmange Powder ...		4		4		1		1
Bread		60		60		39		39
Bread, Fancy		4		4				
Breakfast Food		9		9		2		2
Cake and Pudding Mixture		1		1				
Cornflour		5		5				
Cream of Tartar		2		2				
Crumpets		4		4		2		2
Custard Powder		12		12		1		1

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Dessert Mix		1		1				
Fish Dressing		2		2				
Flour		6	1	7			1	1
Flour, self-raising		2		2		1		1
Flour Confectionery		29		29		17		17
Golden Raising Powder		2		2				
Macaroni, Spaghetti and Similar Products		15		15		4		4
Meal, portion of (Cereal and Milk)		1		1		1		1
Muffin		1		1		1		1
Oatmeal		2		2				
Pancake and Batter Mix		1		1				
Premixes		24		24		2		2
Puddings		19		19		1		1
Rice		12		12				
Sago		3		3				
Sandwich		1		1		1		1
Savoury Rice		1		1				
Semolina		1		1				
Snack Meal		1		1				
Tapioca		4		4		1		1
Childrens Foods:—								
Baby Food		63		63		8		8
Colourings, Flavourings and Mineral Food Adjuncts:—								
Colouring Materials		2		2				
Flavouring Materials		4		4		1		1
Gravy Browning		5		5				
Gravy Powder		7		7		2		2
Gravy Tablets		2		2				
Saccharin Tablets		3		3				
Salt		4		4				
Seasonings (various types)		4		4				
Dairy Products:—								
Butter		21		21		3		3
Buttermilk Drink		1		1		1		1
Cheese and Cheese Spread		73		73		9		9
Cheese Food		1		1		1		1
Cream, Double		22		22		5		5
Cream, Single	1	7		8		1		1
Cream, Sterilised		8		8				
Cream, Fresh, Dessert		1		1				
Cream, Whipping... ..		1		1		1		1
Custard ready to serve		6		6				
Dairy Produce, Canned		1		1				
Ice-Cream		33		33		3		3
Ice-Cream, Dairy		3		3		1		1
Ice-Cream, Cold Mix		6		6				
Milk	842	2195	53	3090	27	157	2	186
Milk, Channel Islands	47	229		276		2		2
Milk, Condensed, Full Cream, Sweetened		1		1				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Milk, Condensed, Full Cream, Unsweetened ...		20		20				
Milk, Condensed, Skimmed Sweetened ...		3		3				
Milk, Dried, Full Cream ...		4		4		2		2
Milk, Dried, Skimmed ...		3	2	5		1	2	3
Milk Dessert ...		7		7		1		1
Milk Dessert Premix ...		1		1				
Milk Drinks (Chocolate Flavoured) ...		3		3		3		3
Milk Puddings ...		16		16		2		2
Milk Substitute ...		1		1				
Yoghourt ...		4		4		1		1
Fish Products:—								
Fish, Bottled ...		9		9		3		3
Fish, Canned ...		69	1	70		6		6
Fish, Cooked ...		4		4		2		2
Fish, Prepared ...		20		20		5		5
Fish, Raw ...		36		36		2		2
Fish, Spreadable ...		10		10				
Fish Salad ...		1		1				
Meal, part of ...		1		1		1		1
Meal Pack (Fried Rice and Shrimps, dry) ...		1		1				
Fruit and Fruit Products:—								
Fruit, Bottled ...		5		5				
Fruit, Canned ...		31		31		7		7
Fruit, Dried ...		46		46		7		7
Fruit, Fresh/Frozen ...		39		39		1		1
Fruit Curd... ...		9		9				
Fruit Pectin ...		1		1				
Fruit Spread ...		1		1				
Jam... ...		25		25				
Marmalade ...		9		9		1		1
Mincemeat ...		14		14				
Pie Filling ...		9		9				
Tomatoes, Canned ...		17		17		7		7
Tomatoes, Raw ...		3		3				
Tomato Paste ...		7		7				
Herbs and Spices:—								
Chives ...		1		1				
Cinnamon, ground ...		1		1				
Coriander Powder ...		1		1				
Curry Mixture ...		3		3				
Curry Paste ...		1		1				
Curry Powder ...		5		5				
Curry Sauce ...		1		1				
Ginger, ground ...		2		2				
Ginger, Stem ...		1		1				
Herbs, Dried, Culinary ...		13		13				
Mustard, Compound ...		1		1				
Mustard, Prepared ...		2		2				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Nutmeg, ground		2		2				
Paprika		1		1				
Pepper, White		1		1				
Peppers Mixed, Dried		1		1				
Pepper, Red, Whole		1		1				
Saffron		1		1				
Spice, Mixed, ground		3		3				
Spice, Pickling		1		1				
Stuffing		3		3				
Meat and Meat Products:—								
Bacon		3		3				
Black Puddings		2		2		1		1
Gelatine		2		2				
Meals, portions of		2		2		2		2
Meal, Dried		1		1		1		1
Meat, Canned		44	1	45		7		7
Meat, Prepared, Canned		41		41		2		2
Meat, loose, open pack, etc.	2	43		45	1	7		8
Meat, Prepared, loose, open pack		30		30		7		7
Meat, Spreadable, loose, open pack		31		31		6		6
Meat Pasties		3		3		1		1
Meat Pies		21		21		7		7
Meat Pie Filling		1		1				
Meat and Potato Pies		5		5		3		3
Meat and Vegetable Pies		2		2		2		2
Meat Puddings		2		2		2		2
Meat Puddings, Canned		7		7		1		1
Meat Puddings, loose		3		3				
Potato and Meat Pies		2		2		1		1
Ready Meals/Snack Meals		29		29		2		2
Sandwich		1		1		1		1
Sausages, Beef		12		12		3		3
Sausages, Pork	1	18		19	1	11		12
Sausages, Cooked		8		8		2		2
Sausage Rolls		1		1				
Miscellaneous Foods:—								
Soup, Canned		32		32		3		3
Soup Mixture, dry		8	3	11		2		2
Nuts and Nut Products:—								
Almonds, ground		14		14				
Chestnut Puree		1		1		1		1
Coconut, Desiccated		10		10		1		1
Marzipan		8		8				
Nuts		7		7				
Peanut Butter		1		1				
Oil and Fat Products:—								
Cooking Oil		4		4				
Dripping		4		4				
Lard		8		8				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Margarine		2		2				
Olive Oil		3		3				
Spread, low fat		1		1				
Suet, Shredded		7		7				
Poultry Products:—								
Chicken, Bottled/Canned		9		9				
Chicken, Cooked		1		1		1		1
Chicken, Frozen		4		4		2		2
Chicken Chop Suey		2		2				
Chicken, Curried, Canned		1		1				
Chicken Dinner, Canned...		1		1				
Chicken Pie		3		3				
Chicken Rissole		2		2				
Chicken Spread		5		5				
Chicken and Vegetables, Canned		1		1		2		2
Eggs		5		5		1		1
Meals, dried		2		2				
Meals, portions of		2		2				
Pie Filling		2		2				
Poultry Spread		8		8				
Snack Meal		1		1				
Turkey, Bottled		1		1				
Turkey, Cooked		1		1				
Turkey and Ham Loaf		1		1				
Remedial and Health Foods:—								
Diabetic Fruit, Canned		2		2				
Diabetic Ice-Cream		1		1		1		1
Diabetic Marmalade		1		1		1		1
Diabetic Sweets		4		4				
Health/Invalid Foods		2		2		1		1
Malt Extract with Cod Liver Oil		1		1				
Slimming Biscuits... ..		3		3				
Slimming Preparations		9		9		8		8
Wheatgerm, Stabilized		1		1				
Soft Drinks and Ice Lollies:—								
Fruit Juice	1	30		31	1	3		4
Fruit Syrup		4		4		1		1
Soft Drinks (various types)		67		67		30		30
Soft Drink Powder		3		3				
Ice Lollies		19		19		7		7
Ice Lolly Mix		5		5		2		2
Sugar and Sugar Products:—								
Brandy Butter		2		2				
Cake Coating		6		6		1		1
Cake Decorations, Edible		9		9		1		1
Flan Filling		1		1				
Glucose and Vegetable Fat Powder		3		3				1
Honey		4		4		1		

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Jelly and Fruit ...		2		2				
Jelly, Table ...		9		9				
Milk Shake Powder ...		4		4				
Milk Shake Syrup ...		2		2				
Rum Butter ...		1		1				
Sugar ...		13		13		4		4
Sugar, Demerara ...		3		3				
Sugar, Icing ...		2		2				
Sweets ...		36		36		11		11
Syrup ...		3		3				
Table Dessert Premixes ...		6		6				
Table Dessert ...		13		13		2		2
Topping (Caramel) ...		1		1				
Table Dressings:—								
Chutney ...		3		3				
Pickles ...		7		7		1		1
Salad Cream/Dressing ...		11		11				
Sauce ...		36		36		3		3
Sauce Powder ...		6		6		1		1
Vinegar ...		9		9		1		1
Vinegar, Cider ...		1		1				
Wine Vinegar ...		1		1		1		1
Vegetable Products:—								
Beans in Tomato Sauce ...		14		14		7		7
Potato Cakes ...		2		2				
Potato Crisps ...		9		9		7		7
Sandwich Spread ...		1		1				
Soup Mixture, dry ...		1		1				
Vegetables, Canned ...		48		48		7		7
Vegetables, Cooked ...		3		3		2		2
Vegetables, Dried ...		16		16		1		1
Vegetables, Prepared ...		1		1				
Vegetables, Raw ...		31		31		7		7
Vegetable Spread ...		2		2				
Vegetable Juice, Canned ...		2		2				
Vegetable Pie ...		4		4		3		3
Vegetable and Prawn Curry with Rice ...		1		1				
Yeast and Yeast Extract:—								
Yeast ...		1		1				
Yeast Extract ...		1		1				
Drugs, External Remedies:—								
Antiseptic Ointment ...		4		4		1		1
Iodine, Tincture of ...		1		1				
Petroleum Jelly ...		6		6		2		2
Rubbing Ointment ...		1		1		1		1
Sulphur Ointment ...		1		1				
Zinc and Castor Oil Cream ...		2		2				
Zinc Ointment ...		2		2				
Baby Powder ...		1		1		1		1
Borax ...		1		1		1		1

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Boric Acid Ointment ...		1		1				
Boric Acid Powder ...		2		2				
Toothpaste ...		3		3				
Drugs, Internal Remedies:—								
Analgesic Preparations ...		19		19				
Cold Relief Preparations...		9		9				
Cough Preparations ...		6		6				
Laxatives ...		16		16		2		2
Indian Brandee ...		1		1				
Indigestion Tablets ...		1		1				
Stomach Preparations ...		12		12				
Vitamin and Mineral Preparations ...		2		2		1		1
Medicines on Prescription:—								
Asmapax Tablets ...		2		2				
Butazolidin Tablets ...		3		3				
Cremosuxidine Suspension		2		2				
Diazepam Tablets ...		2		2				
Distaquaine V-K Suspension ...		1		1				
Eltroxin Tablets ...		2		2				
Franol Tablets ...		2		2				
Hydrosaluric K Tablets ...		2		2				
Icipen V Tablets ...		2		2				
Largactil Tablets ...		2		2				
Librium Capsules ...		1		1				
Medicine ("made up") ...		1		1		1		1
Paramol Tablets ...		3		3				
Phenoxymethyl Penicillin Tablets ...		5		5				
Phthalylsulphathiazole Tablets ...		2		2				
Sonalgin Tablets ...		2		2				
Tryptizol Tablets ...		2		2				
Tuinal Pulvules ...		2		2				
Valium Tablets ...		2		2				
Childrens Medicines:—								
Analgesic Preparations ...		2		2				
Teething Powders...		1		1		1		1
Miscellaneous Drugs and Pharmaceutical Products:—								
Acetic Acid ...		1		1		1		1
Dental Injection Solution		1		1		1		1
Denture Powder ...		1		1				
Totals ...	962	4652	61	5675	30	549	5	584

The Number of Commodities Examined

As new products are added to the range of foods offered to the housewife, so the number of commodities brought to the laboratory for examination increases. As was explained in the 1971 report however, the classification system adopted in 1971 has reduced this ever expanding range to a fairly stable 295 categories, arranged under 25 major headings. In fact, however, over four hundred individually designated categories of products were examined during 1972.

Sampling Rates and Total Adulteration

Each year it is necessary to repeat (in various ways) that the concept of food adulteration is now very hard to define. There are so many new processed foods available that a fresh outlook needs to be brought to the concept of "adulteration". There are cakes for sale whose market appeal depends upon an exact content of water . . . yet that water forms part of the weight. There are meat products whose distinctive taste depends upon the presence of offals—which no doubt a member of the purchasing public might look upon as being undesirable. There is a tendency for food additives to be used which are never commented upon, because no-one ever looks for them. At the time of writing these remarks, namely, as 1972 gives way to 1973, there are vague murmurings about the uncertain safety of saccharin, and in the course of those murmurings there has been comment about cyclamates. One of the things said about cyclamates has been that it used to find use in jam and in cakes. No public analyst is able to comment on this, because it was never prohibited in jam or in cakes. As neither commodity was required to display a list of ingredients, the chances are that its presence was never investigated. If it had been found, there was no prohibition on its use. Food and medicines are usually examined from four points of view. Those are, to check composition against food standards, to assess the adequacy of the labelling, to regulate the use of permitted additives and to look for the possibility of contamination.

The overall percentage of foods found to offend in any of these respects was 10·3 per cent in 1972, but that figure includes a milk adulteration rate of only 6·2 per cent, so that the rate for other foods, etc., was 15·4 per cent.

Table 4, which shows the pattern of sampling over the past ten years, shows some large changes which require comment. One is the steady reduction in formal sampling which is largely due to the reduction in formal sampling of milk. This is partly brought about by changes in retail distribution, but in 1972 it was partly due to the sampling officer strength being under establishment by twenty-five per cent in the first half of the year. The rate of sampling was therefore very uneven in 1972, being only 1·6 per thousand of population in the first quarter, 2 per thousand in the second quarter, 4·8 per thousand in the third quarter and 5·2 per thousand in the last quarter. The laboratory can hardly handle this last rate, so some samples which might have been called adulterated in the first two quarters may have slipped by in the last two quarters. Certain investigations, such as lead in milk, investigation of tanker milk, etc., which are mentioned in

the following pages, were possible in the first two quarters, but these investigations, which should be going on all the time, are not generally possible with present laboratory staffing. The gradual annual reduction in the overall sampling rates is an indication of how the laboratory has had to compensate to an ever increasing work programme on each sample.

It should be remembered that the target rate of sampling which was held up for local authorities to achieve in the days when the early copies of the Annual Reports of the Local Government Boards gave such guidance, was five samples per thousand of the population. The Fifteenth Annual Report of the Ministry of Health for 1933-4 suggested that three samples per thousand might be adequate, and Lancashire County Council published a memorandum in 1934 entitled: "The General Principles and the Law Relating to the Taking of Samples under The Food and Drugs Adulteration Act 1928", in which, paragraph eight says: "Of every 100 samples, approximately 65 should consist of milk and skimmed milk". The last guidance to be given on sampling appears to have been Circular 1830 from the Ministry of Health in 1939, issued by L. Stanton, but that did not mention rates of sampling.

The present proportionality of milk to other samples is about 50/50. It is therefore with something of a sense of pride that the laboratory records in Table 4 how well, under the circumstances, it has kept up with the needs of the inspectorate.

Table 4
Sampling and Unsatisfactory Samples 1963-1972

Year	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Percentage of Adulteration ...	5.8	7.2	6.4	5.3	4.9	5.4	6.3	7.1	9.6	10.3
Total Samples ...	8,243	7,766	7,959	8,190	8,055	7,661	6,722	6,832	6,337	5,675
Formal Samples ...	2,686	2,528	2,216	2,577	2,126	2,112	1,705	1,764	1,069	962
Informal Samples	5,211	4,855	5,333	5,003	5,465	5,130	4,688	4,760	5,069	4,652
Private Samples ...	346	383	410	610	464	419	329	308	199	61
No. of Adulterated Samples ...	480	562	512	436	398	411	426	488	610	584
Number of Samples per 1,000 of the population ...	5.39	5.41	5.34	5.50	5.37	5.10	4.2	4.1	4.0	3.4

Total Adulteration. The County compared with other areas

It may also be of interest to note that if the proportionality of workload to staffing found in public analysts departments throughout the country were maintained in Lancashire there would be a staff of 36 instead of County Laboratory's modest 26. Despite the operation of a department at continuous full throttle without any margins whatever for untoward circumstances, its comparative performance in the detection of adulteration bears scrutiny.

Each year a number of other authorities are kind enough to supply figures which show the proportion of samples which they have found to be unsatisfactory in the number of samples which have been examined. Table 5 shows that the Lancashire laboratory is missing no more adulteration than other laboratories miss.

Table 5
Total Adulteration, 1972, Various Authorities

Area	No. of Samples	Percent. of Adult.	Area	No. of Samples	Percent. of Adult.
Lancashire, County ...	5,675	10·3	Leeds... ...	1,931	11·3
Durham, County ...	3,699	3·9	Leicester ...	1,770	4·0
Kent, County ...	3,005	6·9	Liverpool ...	2,534	3·0
Somersetshire, County	2,542	2·2	Manchester ...	2,250	4·3
Birmingham ...	2,249	1·5	Southampton ...	725	2·8
Bristol ...	1,571	1·0			

Table 6 shows how milk adulteration has been reported.

Table 6
Milk Adulteration, 1972, Various Authorities

Area	No. of Samples	Percent. of Adult.	Area	No. of Samples	Percent. of Adult.
Durham, County ...	732	1·6	Leicester ...	485	Nil
Kent, County ...	711	2·1	Liverpool ...	1,408	7·1
Somersetshire, County	762	1·5	Manchester ...	510	3·7
Birmingham ...	295	Nil	Southampton ...	249	2·4
Bristol ...	299	1·7	Lancashire, County	3,090	6·2
Leeds ...	1,063	4·2			

Adulteration in County Districts

There are 91 districts in the area of the County Food and Drugs Authority.

Table 7 shows the number of samples taken in each of the districts and the number found to be unsatisfactory.

Composite figures for 16 autonomous authorities are also shown.

Table 7

Adulteration in the County Districts and in the areas of 16 Autonomous Food and Drugs Authorities in the North West during the year 1972.

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Abram U.D.C.	20	4	7	1	27	5
Adlington U.D.C.	9	1	4	1	13	2
Ashton-in-Makerfield U.D.C. ...	40	2	24	4	64	6
Aspull U.D.C.	8	0	8	0	16	0
Atherton U.D.C.	27	1	28	4	55	5
Audenshaw U.D.C.	9	0	17	0	26	0
Bacup Borough	70	2	33	0	103	2
Barrowford U.D.C.	10	0	8	0	18	0
Billinge and Winstanley U.D.C. ...	17	2	26	0	43	2
Blackburn R.D.C.	63	1	12	2	75	3
Blackrod U.D.C.	24	2	0	0	24	2
Brierfield U.D.C.	16	0	7	0	23	0
Burnley R.D.C.	59	0	6	2	65	2
Carnforth U.D.C.	6	0	24	3	30	3
Chadderton U.D.C.	37	0	32	8	69	8
Chorley R.D.C.	47	1	32	3	79	4
Church U.D.C.	9	0	6	0	15	0
Clayton-le-Moors U.D.C. ...	13	0	6	0	19	0
Clitheroe Borough	23	3	23	2	46	5
Clitheroe R.D.C.	22	1	16	1	38	2
Colne Borough	47	5	23	10	70	15
Crompton U.D.C.	34	0	49	10	83	10
Dalton-in-Furness U.D.C. ...	15	0	12	2	27	2
Denton U.D.C.	46	0	63	8	109	8
Droylsden U.D.C.	29	2	41	2	70	4

Table 7—continued

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Failsworth U.D.C.	32	2	31	2	63	4
Farnworth Borough	89	8	62	9	151	17
Fleetwood Borough	24	0	41	6	65	6
Formby U.D.C.	14	2	5	0	19	2
Fulwood U.D.C.	32	1	60	8	92	9
Fylde R.D.C.	22	0	29	5	51	5
Garstang R.D.C.	30	2	43	8	73	10
Golborne U.D.C.	59	5	74	7	133	12
Grange U.D.C.	2	0	13	1	15	1
Great Harwood U.D.C.	40	2	2	1	42	3
Haslingden Borough	29	2	30	3	59	5
Haydock U.D.C.	37	0	21	2	58	2
Heywood Borough	109	11	44	7	153	18
Hindley U.D.C.	43	6	51	9	94	15
Horwich U.D.C.	21	2	34	9	55	11
Ince-in-Makerfield U.D.C.	51	7	13	0	64	7
Irlam U.D.C.	24	1	30	0	54	1
Kearsley U.D.C.	14	0	28	4	42	4
Kirkham U.D.C.	6	0	13	2	19	2
Lancaster R.D.C.	33	0	15	1	48	1
Lees U.D.C.	19	1	8	1	27	2
Leyland U.D.C.	16	3	47	13	63	16
Litherland U.D.C.	47	3	22	6	69	9
Littleborough U.D.C.	43	5	16	3	59	8
Little Lever U.D.C.	13	1	18	4	31	5
Longridge U.D.C.	16	1	3	2	19	3
Lunesdale R.D.C.	35	1	17	1	52	2
Lytham St. Annes Borough	27	0	80	15	107	15

Table 7—continued

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Milnrow U.D.C.	31	2	38	5	69	7
Mossley Borough	31	1	12	3	43	4
Nelson Borough	44	3	47	10	91	13
North Lonsdale R.D.C.	50	3	13	1	63	4
Ormskirk U.D.C.	36	2	85	16	121	18
Orrell U.D.C.	6	0	1	0	7	0
Oswaldtwistle U.D.C.	77	3	5	2	82	5
Padiham U.D.C.	18	1	12	1	30	2
Poulton-le-Fylde U.D.C.	13	0	29	2	42	2
Preesall U.D.C.	8	0	2	0	10	0
Prescot U.D.C.	20	1	27	2	47	3
Preston R.D.C.	92	9	71	13	163	22
Prestwich Borough	35	4	53	8	88	12
Radcliffe Borough	64	1	28	10	92	11
Rainford U.D.C.	21	3	6	2	27	5
Ran sbottom U.D.C.	20	3	17	4	37	7
Rawtenstall Borough	31	1	26	1	57	2
Rishton U.D.C.	17	0	6	2	23	2
Royton U.D.C.	52	5	46	5	98	10
Skelmersdale and Holland U.D.C.	30	2	22	9	52	11
Standish-with-Langtree U.D.C. ...	8	1	17	3	25	4
Thornton-Cleveleys U.D.C. ...	26	0	51	6	77	6
Tottington U.D.C.	23	0	6	3	29	3
Trawden U.D.C.	7	0	0	0	7	0
Turton U.D.C.	40	1	15	3	55	4
Tyldesley U.D.C.	34	2	33	3	67	5
Ulverston U.D.C.	27	0	13	1	40	1
Walton-le-Dale U.D.C.	85	1	51	6	136	7

Table 7—continued

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Wardle U.D.C.	26	0	9	0	35	0
Warrington R.D.C.	136	8	63	10	199	18
West Lancashire R.D.C.	91	7	142	12	233	19
Westhoughton U.D.C.	57	3	56	6	113	9
Whiston R.D.C.	116	17	91	28	207	45
Whitefield U.D.C.	26	0	54	8	80	8
Whitworth U.D.C.	32	2	18	1	50	3
Wigan R.D.C.	7	1	10	2	17	3
Withnell U.D.C.	14	0	13	0	27	0
Miscellaneous	12	6	40	18	52	24
<hr/>						
Total: County Districts	3,090	186	2,585	398	5,675	584
Sixteen Autonomous Food and Drugs Authorities	547	35	1,614	308	2,161	343
<hr/>						
Total All Sources	3,637	221	4,199	706	7,836	927

MILK

Adulteration of Milk in the County

The number of milk samples submitted under the Food and Drugs Act in 1972 was 3,090 and of these 186 were given adverse reports. The amount of milk adulteration was, therefore, 6.2 per cent. Table 8 shows the adulteration rates for the past 10 years.

Table 8
Adulteration of Milk, 1963–1972

Year	No. of Samples	No. of Adulterated Samples	Percentage of Adulteration
1963	4,823	250	5.2
1964	4,268	319	7.5
1965	4,415	290	6.6
1966	4,403	207	4.7

Table 8—continued

Year				No. of Samples	No. of Adulterated Samples	Percentage of Adulteration
1967	...	...	...	4,133	137	3·3
1968	...	...	...	4,177	161	3·8
1969	...	...	...	3,716	127	3·4
1970	...	...	...	3,739	156	4·1
1971	...	...	...	3,329	202	6·1
1972	...	...	...	3,090	186	6·2
Total				40,096	2,035	5·1

Seasonal Adulteration of Milk in the County

The correlation between the detection of milk adulteration and the period of the year in which milk quality falls off naturally is again evident when the figures in Tables 9 and 10 are compared.

Table 9

Milk—Seasonal Adulteration 1972

Quarter				Number of Samples	Number Adulterated	Percentage Adulteration
Jan.—Mar.	Winter	...	...	540	64	11·8
Apr.—June	Spring	...	...	540	36	6·7
July—Sept.	Summer	...	...	931	35	3·7
Oct.—Dec.	Autumn	...	...	1,062	51	4·8
Total	...	...	...	3,073	186	6·2

The above table and table 10 include 16 appeal-to-cow samples but exclude 33 samples which were examined for foreign matter, etc.

Table 10
Average Composition of Milk, 1972

Month	Number of Samples	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
January	225	3.73	8.55	12.28
February	540 { 172	3.71 { 3.71	8.55 { 8.54	12.26 { 12.25
March	143	3.68	8.55	12.23
April	115	3.70	8.57	12.27
May	540 { 204	3.67 { 3.63	8.71 { 8.71	12.38 { 12.34
June	221	3.69	8.78	12.47
July	264	3.75	8.70	12.45
August	931 { 234	3.75 { 3.71	8.71 { 8.66	12.46 { 12.37
September	433	3.78	8.73	12.51
October	411	3.88	8.70	12.58
November	1,062 { 414	3.90 { 3.93	8.63 { 8.60	12.53 { 12.53
December	237	3.88	8.59	12.47
Whole Year ...	3,073	3.78	8.66	12.44

Types of Adulteration of Milk

The various types of adulteration and the number of samples which were found in each adulteration category are shown in Table 11.

Table 11
Analysis of Milk Adulteration

			Per cent.
Milk deficient in fat only	38	or	1.30
Milk containing added water only	97	or	3.15
Milk deficient in fat and containing added water	1	or	0.05
Milk containing penicillin	9	or	0.32
Milk containing foreign matter	37	or	1.21
Milk containing penicillin and added water ...	1	or	0.05
Milk incorrectly described	3	or	0.12
	186		6.20
Milk containing more than 3 per cent added water	8	or	0.26
Milk 10 or more per cent deficient in fat ...	16	or	0.52

"Serious" Milk Adulteration

Table 11 shows that only twenty four milk samples which were examined in County laboratory in the year 1972 either contained more than three per cent of extraneous water or showed a deficiency of fat amounting to ten per cent or more. This is the smallest number of seriously adulterated milk samples to have been recorded since the analysts Annual Reports were re-introduced after the war with Japan ended.

In the first quarter, milk sampling had been reduced to only 547 samples, and despite this being the period of the year when milk quality is usually at its lowest, no seriously watered milks were encountered.

In the second quarter, the number of milk samples examined was again only 548, and in this period there were three seriously watered milks. All were Sterilised Milks. The first (sample No. E9887) contained only a relatively small amount of extraneous water, but a statutory certificate was issued because the 3.5 per cent minimum of extraneous water which was calculated on the assumption that -0.530°C is the highest freezing point likely to be encountered in a single individual cow, became 5.1 per cent of extraneous water if the usual maximum freezing point of genuine *bulk*ed milk was taken as the standard for comparison. Sterilised milk is normally processed in fairly large quantities. The second sample was a complaint sample, sample number C1817. This was submitted in an opened bottle with no closure, and although it contained 31 per cent of extraneous water the specimen was therefore not one which would inspire much confidence in proceedings taken before a magistrate. The third sterilised milk, sample C1856, was an informal sample which contained 18.9 per cent water. With sterilised milk, a cap leak can mean that only the individual bottle is affected, and another informal sample taken from the same plant a week later was found to be genuine.

In the third quarter, the number of samples submitted was about as many as in the first two quarters combined, but only one seriously watered milk was encountered, that being informal sample N5165, which contained 8.4 per cent of extraneous water. The formal sample N5177 which followed it up was found to be genuine.

In the last quarter, the seriously watered milks included three samples in which the amounts of extraneous water amounted to less than five per cent and one in which it was found to be 7.3 per cent. The three smaller quantities occurred in sample N5845 which did contain 4.9 per cent of water, but it was so deficient in milk solids not fat that an Appeal to Cow sample, sample 777 was taken. This was genuine milk but it was naturally nearly fifteen per cent deficient in its solids not fat content, and veterinary advice was advocated. Sample number C2737 was another informal sterilised milk sample in which 4.8 per cent of extraneous water occurred. It was not followed up until three months later, but the follow up sample was then found to be genuine milk. Sample E814, a sample of untreated milk which contained 3.8 per cent of water, was followed up within two days, but the formal sample proved to be genuine milk. The sample N5832

which contained over seven per cent of water had been taken formally, and it resulted in a fine of £25 for the vendor.

Morning and evening milkings are usually separated by uneven periods of time, and cows tend to give lower fat contents in milk taken after the longer interval from the night milking to the morning one, than they give at the evening milkings. For this reason it has not been the policy of Lancashire County to regard as 'very serious' any fat deficiency which might be accounted for by differences in milking times. It therefore tends simply to issue a caution on first occurrences of fat deficiencies up to fifteen per cent. Out of the sixteen samples which might be regarded as having been seriously deficient in fat therefore, no fewer than eight fell into this category. Sample C2212 which was 53·3 per cent deficient in fat was an informal sample, and the formal follow up was found to be genuine. As far as the laboratory's records show, the informal samples E9803, E765 and S307 which had fat deficiencies amounting to 45 per cent, 31·6 per cent and 16·6 per cent respectively never were followed up. Appeal to Cow samples taken in connection with sample E394, sample N5598, and sample N5599 showed that the milks being produced by the cows in the herds were naturally poor in fat. Alas, with sample C2668, which was fifty per cent deficient in fat and had even caused the inspector to go through the early morning rituals of getting an Appeal-to-Cow sample . . . somehow became lost in the preparation of the case for court, and it slipped beyond the time limits for milk cases to be brought to court. With sample E9803, however, the reason for abandoning the matter may have been partly due to laboratory understaffing. The sample was submitted on 27th April, but the report was not typed until 5th May and the inspector did not receive it until 8th May . . . and it is difficult to deal with fat deficiencies eleven days after the event.

On page 58 of the 1971 Annual Report there was mention of a case (sample E8487) in which an Appeal connected with Section 113 of the Act had succeeded. The farmer had blamed a temporary employee for the presence of water in the milk sample, and the temporary employee had been fined. The said employee had then appealed against the decision, but since the employee was in court as a result of the farmer's cross summons, the Appeal had to be upheld when the farmer declined to give evidence against him at the Appeal case. The outcome was therefore a Magistrate's decision that an offence had been committed while those responsible had been cleared.

The Ministry of Agriculture, Fisheries and Food was consulted upon the matter and their reply included the following paragraphs:—

Our advisers agree with Counsel's conclusion that in the circumstances outlined there is no obligation or duty on the original defendant to give evidence in the capacity of prosecutor. Although it might not be possible to amend the section itself so as to impose a duty, a more suitable form of words to cover this kind of situation (offences due to the fault of another person) does exist elsewhere in our legislation—for example in section 23 of the Trade Descriptions Act 1968 which as you probably know states that "where the commission by any person of an offence under this Act is due to the act or default of some other person that other person shall be guilty of the offence, and a person may be charged with and convicted of the offence by virtue of this section whether

or not proceedings are taken against the first-mentioned person". There are of course obvious advantages in this provision as compared with section 113 of the 1955 Act. Not only can proceedings be taken against the third party or other person without first taking proceedings against the original defendant, but also it may not be necessary to rely on the evidence or co-operation of the original defendant in order to secure a conviction. In the case of section 113 however the proceedings against both parties are to a large extent inter-related or inter-dependent.

I understand that the type of case to which you refer is by no means a common occurrence, and in fact our lawyers cannot recall a similar one having arisen for some years past. We do however appreciate that in practice provisions on the lines of section 23 of the 1968 Act would be easier to operate from the prosecution standpoint, and we will consider amending section 113 of the 1955 Act accordingly when that Act becomes due for revision. It is quite likely that some amendments to the 1955 Act may be necessary in due course as a result of UK entry into the EEC and we shall certainly bear section 113 in mind at that time.

Table 12 shows that most of the prosecutions involving milk in 1972 arose because of extraneous matter in the milk. In two instances they were for sale of raw milk as Pasteurised Milk.

Table 12
Milk Prosecutions 1972

NOTE: Legal proceedings were taken under Section 2 of the Food and Drugs Act, 1955, unless otherwise stated.

Number of Sample	Nature of Adulteration or Irregularity	Observations
C.1771 } C.1772 }	Not pasteurised milk as described.	Fined £10 and £16 costs.
S.8988	Contained a matt of dead fungal mycelium and spores. Blotted moist weight 11.9 grams, together with extraneous water in the milk amounting to 13.6 per cent.	Sections 2 and 113(3), Fined £30 and £5 costs.
N.4758	Contained a dead house mouse weighing 44 grams and 2.1 per cent of extraneous water.	Sections 2 and 113(3), Fined £100 and £13 costs.
C.1732	Contained one heat treated dead earwig weighing 45 milligrams together with a plain aluminium milk bottle cap weighing a third of a gram.	Fined £20 and £13 costs.
S.9314	Contained a torn rectangle of aluminium foil backed with thin paper, a piece of cellpohane and three black particles of charred fibrous material.	Sections 2 and 113(3), Fined £20 and £8 costs.
C.2466	Contained fragments of broken glass weighing in all 10.343 grams.	Fined £20 and £15 costs.
S.9817	Contained mould and also 5.1 per cent extraneous water.	Fined £40 and £9.50 costs.

Table 12—continued

Number of Sample	Nature of Adulteration or Irregularity	Observations
E.803	Contained a piece of cardboard weighing 1.94 grams (dry) marked on one side with ball-point pen ink "no milk today thank you".	Fined £30 and £15 costs.
S.300	Contained broken glass weighing 0.193 gram.	Fined £75 and £28.50 costs
E.666	Not pasteurised milk as described.	Fined £5 and £15 costs.
N.5832	Deficient 10.0 per cent solids-not-fat and contained 7.3 per cent extraneous water.	Section 32, Fined £25 and £10 costs.
S.280	Contained broken glass weighing in all 1.036 grams.	Fined £20 and £18 costs.
M.847	Contained broken glass weighing in all 5.511 grams.	Sections 2 and 113(3), Fined £25 and £15 costs.
M.294	Contained broken glass weighing 0.404 gram.	Fined £40 and £9.50 costs.
Autonomous Authorities		
M.5 <i>Lancaster City</i>	Contained cement mortar (proportions 1 part Portland cement to 2 parts sand) of dry weight 0.398 gram.	Fined £15.
8940 <i>Preston C.B.</i>	Contained broken glass comprising a piece measuring 56 x 25 millimetres and weighing 9.48 grams together with a further 0.014 gram of small fragments and powder (23 pieces of not less than 1 millimetre maximum dimension, and rather more than forty particles of smaller dimensions).	Fined £10.
C.21/72 <i>Morecambe & Heysham B.</i>	Contained several particles of dead mould (eight to ten recovered) weighing about half a milligram.	Fined £10 and £6 costs.

The pattern of the milk adulteration may also be shown in relation to the various grades of the milk offered for sale.

Table 13
Adulteration of the Various Grades of Milk

Grade of Milk			Number of Samples	Number Adulterated	Percentage of Adulteration
Pasteurised	...	...	1,262	78	6.2
Sterilised	...	...	526	25	4.7
UHT	...	...	185	31	16.7
Untreated	...	...	1,133	52	4.6
Channel Islands	...	...	276	2	0.7

It was remarked upon, in the 1971 report, that whereas the greatest rate of milk adulteration had formerly always been seen in untreated milk, the greatest adulteration rate in the year 1970 occurred with pasteurised milk, and in 1971 it occurred with Ultra Heat Treated Milk.

There may have been a change in sampling procedures which could have affected the Untreated milk returns, but it is more likely that more of the milk sampled as Untreated milk is currently derived from bulked supplies than was formerly the case. Pasteurised milk and U.H.T. milk must necessarily be bulked milks. The bulking process does tend to disguise minor shortcomings like marginal fat deficiencies which may occur in individual churns. To some extent it also disguises the presence of any small quantities of extraneous water which might be obvious enough in a single churn, but would become a very small or even an undetectable amount of water if dispersed in several hundred gallons of good milk.

The EEC legislation will accept adjustment of milk quality by bulking procedures, and we shall need to reflect that whereas the presence of one per cent of water in a ten gallon churn has tended to be regarded as a fairly minor piece of carelessness, one per cent of water in a five thousand gallon tank represents fifty gallons of water. It has therefore been a matter about which some concern has been felt, that such a large proportion of the U.H.T. milk samples examined over the past two years should have shown the presence of small amounts of extraneous water, and that, next to U.H.T. milks, the greatest incidence of minor adulteration should have occurred with Pasteurised milk. The average analytical values for U.H.T. milk in 1972 are shown in table 14.

Table 14
Analytical Data of UHT Milk

Fat	Solids-not-fat	Total Solids	Freezing Point (Hortvet) °C.
3.77	8.66	12.43	-0.528

A letter dated 6th April, 1973, received by the Lancashire Authority from the dairy firm Messrs. Unigate, states that the early difficulties which had been experienced with the U.H.T. process have now been overcome. One certainly hopes that this is true for all firms which use the process, because the *average* freezing point depression for all the U.H.T. milks examined in the laboratory in 1972, was equivalent to the presence of 0.3 per cent of extraneous water in all those samples throughout the year. A further observation to be made from the laboratory's vantage point is that the average chemical compositions have also altered. In the first year of keeping special records of the results for this type of milk, the best figures which have been obtained were seen, and since that time the annual average compositions have remained very constant. It would seem, therefore, that there is already some adjustment of composition taking place. In view of this, it is disturbing that initially the milk showed freezing point depressions which the British Standard No. 3095 considers to be appropriate to bulked milk, and subsequently this depression has slowly changed first to one which normally occurs only in a few individual cows, and in 1972 it had gone further, to a figure which one might encounter naturally only a few times in a lifetime and with very abnormal cows. Early in 1973 a dairy from further afield was writing to say that the process itself gave rise to abnormal freezing points. It was in prediction of such a statement that Table 14 was introduced in 1968.

Just as bulk selling in hypermarkets seems to have begun full of promise, yet by early 1973 was in danger of causing an American shoppers' revolt, and bulk education began full of promise and has now led universities to say that school leavers cannot read, spell or do arithmetic (a survey showed that not even student teachers had any idea of the value of the square root of 0.9) so bulk handling of milk began with mechanised processes which seemed superior to older methods, but as the mechanisation itself suggested further economies in manpower, so the quality of the product has been allowed to deteriorate. Messrs. Unigate's confident assurance was timely, but the problem did not appear to be one connected with "early difficulties". It appeared to be one which had developed in an initially satisfactory process.

The problem may have originated with road tankers. A survey of freezing points of milk taken from collection tankers in 1971 showed that eighty-eight per cent of those examined in the laboratory had freezing point depressions below the British Standard recommended freezing point for

bulk milk. The laboratory requested further sampling of tanker milk in 1972, but only twenty-nine such samples were actually submitted. Of those, five reached the British Standard recommended freezing point depression for bulk milk, and seven failed to reach the freezing point depression normally taken as the least likely to be found in any unadulterated milk from a reasonably healthy cow.

Milk supplied to Schools, Day Nurseries, Homes for the Elderly and Mental Health Training Centres

The fifty-three samples of milk entered in the column headed "Private" in Table 3 were taken from consignments delivered to County Institutions. "School Milk" is still supplied to children aged under seven. Of these, two were found to be unsatisfactory. Both of those unsatisfactory samples contained small amounts of extraneous water, and the two dairies concerned were each cautioned.

The Standards of Quality for Milk

In last year's annual report it was stated that the standards of quality for milk appeared to be likely to change on Britain's entry into the Common Market. The first big change which was expected was a prohibition on sale of heat treated milk having a fat content below three and a half per cent, but the Dairy Industry felt that it had neither the plant nor the know-how for this, and standardised milk will probably not become a fact of British life until 1st January, 1976. The trade seemed to believe that there could be consumer reaction against standardised milk but the real fear may have been that a sudden public demand for the new Middle Grade of heat-treated milk, which will only contain between 1.5 and 1.8 per cent of fat, might put an excess of butter on to a very sensitive butter market. It was also concerned about Intervention Prices having initially been set so low that the trade felt that it had too little finance for large marketing changes to be made possible all at once. Throughout 1972 therefore, (and probably for some time to come), Britain was still working to its own well-established rules about milk quality. These are partly stated in some presumptive standards which are laid down in The Sale of Milk Regulations 1939, and say that milk may be presumed to be 'Genuine Milk' if the fat content exceeds 3.0 per cent of milk fat and the solids other than fat content exceeds 8.5 per cent. Section 32 of the Food and Drugs Act prohibits the addition of water to milk (it also prohibits the additions which might be necessary in order to standardise milk composition), and Section 2 of the Food and Drugs Act prohibits sale of any food whose nature, whose substance or whose quality has been changed to a purchaser's prejudice.

There is some case law, the most important being *Hunt v Richardson* which established that sub-standard milk provided in that state by the cow was still 'Genuine', and it has also been established that poor quality milk sold as a result of drawing milk from a tap at the bottom of a churn of unstirred milk is not as the cow gave it and is therefore not genuine milk.

The determination of freezing point on a very large number of cows' milk samples over a period of about forty years has also established a

convention, now embodied in British Standard No. 3095, that whole milk from a single cow is unlikely to have a freezing point depression of less than -0.530°C . . . but it also notes that the average value is -0.545°C .

The delay in the introduction of "Middle Grade" milk and low-fat milk (with a fat content below 0.5 per cent) served to remind people that more juggling with milk prices was expected than actually took place. The Common Market system for protecting its Dairy Product Market depends on the fact that three quarters of the milk output goes for making butter, cheese and so on, and the whole Common Market system pivots about its control mechanism as operated for the price of dairy products. It is done by fixing a minimum importation price called the *Threshold Price*, and even if cheaper goods are brought in from outside the market, this price must be paid—the difference being made up by the imposition of levies. (There are similar levies on all manufactured products). The system only works, however, if, in fact, somebody is offering cheap imports. Unfortunately the Market is producing more than its need of milk and butter, so that its own surpluses are in danger of reducing the selling prices of these commodities. The mechanism by which this is held in check is the official *Intervention System*, under which governments can buy unlimited quantities of butter and skimmed milk (provided that those meet certain standards) and they buy them at a fixed price. Thus the State buys butter and skimmed milk at prices which the producer needs in order to continue to produce milk. Only these two products are involved, because whenever any other product drops in price the producer will withdraw milk supplied for that commodity, and put it into the butter or skimmed milk manufacture for which he obtains a guaranteed price. In the British system, sales and prices of liquid milk had to be kept artificially high in order to make cheap manufacturing milk available so that the Butter and Cheese industries could compete with cheap imports from abroad. Under the new system therefore, the price of liquid milk should fall dramatically. The best the English housewife actually got in 1972 was a reduction of half a new penny per pint for four months beginning on April 2nd. The end of cheap manufacturing milk may be the end of products like Yoghurt, however. Similarly an excess of butter, just at the moment, could become an acute embarrassment—so we are unlikely to see the lower fat grades of milk until after butter prices have been adjusted.

Channel Islands and South Devon Milk

A special standard of 4 per cent of milk fat was the minimum prescribed for "Channel Islands Milk" and "South Devon Milk", first in The Milk (Control and Maximum Prices) (Great Britain) Order 1947 and later in the Milk and Dairies (Channel Islands and South Devon Milk) Regulations 1956. The milk is defined in The Milk (Great Britain) Order 1971 as being milk which is produced from cows of the Channel Islands Breeds and which is labelled "Channel Islands Milk", "Jersey Milk", or "Guernsey Milk" when sold in a container. This order revoked The Milk (Great Britain) Order 1967 and its amendment orders of 1969 and 1970.

During 1972 there were 176 samples of Channel Islands Milk examined for the County. Of these two informal samples were reported upon

adversely. Sample No. E9296 contained 0.05 I.U. penicillin per cm³, but after the major dairy concerned had carried out an investigation of the producer's milks, all remaining consignments were found to be free from penicillin. The other sample, No. S231, was deficient of 28.7 per cent fat but a follow-up sample taken one week later was found to be genuine channel islands milk having a fat content of 4.9 per cent.

The Average Composition of Milk during the year

The average (or mean) composition of the milk samples examined in County Laboratory during the year 1972 is shown in Table 15. Possibly the median figures (i.e. the middle reading in each of the whole series) and the modes (i.e. the values which occur most often) are also worth recording, although these could be ascertained by an inspection of the frequencies tables, Table number 18 and Table number 19. Our knowledge that a greater proportion of bottled milk samples was taken in 1972, makes the possibility of the higher total solids figure for 1972 being related to milk bulking, an attractive speculation to indulge.

Table 15

Milk Composition 1972

	Fat (per cent)	Solids-not-fat (per cent)	Total Solids (per cent)
Mean	3.78	8.66	12.44
Median	3.75	8.65	12.40
Mode	3.7	8.6	12.3

The Average Composition of Milk Compared with Past Years

The Lancashire annual milk averages for the past 20 years are shown in Table 16 below.

Table 16
Average Composition of Milk, 1953-1972

Year	Number of Samples	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1953	5,922	3·68	8·68	12·36
1954	5,182	3·71	8·65	12·36
1955	5,686	3·68	8·66	12·34
1956	5,524	3·71	8·59	12·30
1957	5,485	3·68	8·63	12·31
1958	5,439	3·68	8·63	12·31
1959	5,304	3·62	8·62	12·24
1960	5,062	3·64	8·66	12·30
1961	5,216	3·66	8·66	12·32
1962	5,420	3·70	8·61	12·31
1963	4,825	3·69	8·60	12·29
1964	4,283	3·70	8·60	12·30
1965	4,430	3·72	8·65	12·37
1966	4,446	3·70	8·63	12·33
1967	4,210	3·70	8·63	12·33
1968	4,178	3·74	8·64	12·38
1969	3,718	3·76	8·60	12·36
1970	3,719	3·77	8·60	12·37
1971	3,333	3·72	8·61	12·33
1972	3,073	3·78	8·66	12·44
1953 to 1972 ...	94,455*	3·70	8·63	12·33

*Does not include Channel Islands milk and milk examined for foreign matter only.

The Average Composition of Morning and Evening Milk during the year

Usually, if the information is available when milk samples are submitted, the laboratory is told whether they were from morning or evening milkings. It has therefore been possible to show the average composition of morning and evening milks separately.

When milking takes place at the usual milking times of farms, there is a longer interval between the evening and morning milkings than between the morning and evening ones. The cow would almost appear to secrete milk fat in inverse proportion to the fullness of her udder, for evening milk, after the shorter interval, is usually richer in fat than morning milk. It has been said that a delay of only one hour on the

morning milking time, resulting in an extended night interval of milk secretion, can reduce the fat content of morning milk by 0.2 per cent. There is seldom any visible difference between the results obtained for solids-not-fat on morning and evening milks, however. The figures obtained on the milks sampled in 1972 are shown in Table 17.

Table 17

The Average Compositions of Morning and Evening Milk Samples for the year 1972

	Number of Samples*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk ...	380	3.69	8.66	12.35
Evening Milk ...	343	3.95	8.61	12.56
Mixed Milk ...	79	3.91	8.70	12.61
Unknown ...	2,271	3.77	8.65	12.42
Total ...	3,073	3.78	8.66	12.44

*Includes Appeal-to-Cow samples but does not include Channel Islands milk and thirty-three samples of milk examined for foreign matter only.

The Composition of Milk: Frequencies

For the student of milk composition, the most useful tables we provide are those showing "frequencies". The two tables which follow divide the 3,073 samples of milk which were examined for chemical composition during the year into groups, according to the fat contents found, in the one table, and the amounts of solids-not-fat found, in the second table, with reference to each month of the year. The tables include the adulterated milks and the "appeal-to-cow" samples, and besides showing that Lancashire milk in 1972 tended toward a fat content of 3.70 per cent and a solids-not-fat content of 8.60 per cent, they show that a higher proportion of the milk samples contain less than the presumptive limit of 8.5 per cent for solids-not-fat than falls below the presumptive limit of 3.0 per cent for milk fat.

Table 18

Milk Fat Frequencies 1972

Per cent.	Number of Samples												Total
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
under 2.5	—	—	—	1	—	—	—	—	2	2	2	—	7
2.5	—	—	1	—	1	—	—	—	—	1	1	—	4
2.6	—	—	—	—	1	—	2	1	1	—	1	—	6
2.7	—	—	1	4	1	—	1	—	1	1	1	—	10
2.8	—	—	—	2	3	1	—	1	1	2	—	—	10
2.9	—	—	1d	—	—	1	2	—	1	—	1	—	6
3.0	1	3	1	3	2	2	2	6	4	2	1	—	27
3.1	—	3	—	—	5	6	4	4	2	2	1	—	27
3.2	3	3	1	—	7	4	6	8	3	5	6	—	46
3.3	4	1	5	3	11	5	11	14	5	11	7	1	78
3.4	13	4	4	9	22	8	12	9	22	15	9	2	129
3.5	10	10	12	9	42	30	18	10	23	11	13	7	195
3.6	33	31	21	27	51	67	48	47	80	23	19	12	459
3.7	75	51	59	29	28	41	68	68	108	61	32	45	665
3.8	54	50	23	11	6	12	29	23	72	92	72	67	511
3.9	18	5	6	1	2	15	17	10	29	74	108	51	336
4.0 and over	14	11	8	16	22	29	44	33	79	109	140	52	557
Totals	225	172	143	115	204	221	264	234	433	411	414	237	3,073

Table 19
Milk Solids-not-fat Frequencies 1972

Per cent.	Number of Samples												Total
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Under 7·8	—	—	—	—	—	1	—	—	1	—	—	3	5
7·8	—	—	—	—	—	—	—	—	—	—	—	—	—
7·9	—	—	1	—	—	—	—	—	1	—	—	—	2
8·0	—	1	—	—	—	—	1	—	—	—	2	1	5
8·1	—	—	1	—	2	—	—	2	—	—	1	—	6
8·2	5	3	3	2	3	—	2	1	2	—	4	2	27
8·3	12	7	7	5	1	—	3	3	4	1	6	7	56
8·4	12	16	10	9	3	1	8	7	2	7	23	10	108
8·5	126	90	81	53	26	11	34	45	31	52	128	61	738
8·6	39	40	20	26	46	27	72	84	108	129	154	102	847
8·7	13	5	8	9	61	76	77	49	138	126	57	35	654
8·8	8	7	8	4	33	57	27	19	79	58	22	11	333
8·9	9	2	3	2	17	34	23	16	41	21	10	3	181
9·0 and over	1	1	1	5	12	14	17	8	26	17	7	2	111
Totals	225	172	143	115	204	221	264	234	433	411	414	237	3,073

Samples of Milk taken for Comparison

The legal principle that a man is innocent until proved guilty is not universally applicable, and because the principle is reversed in the Food and Drugs Act there are certain safeguards for the vendor who is found to be in possession of adulterated milk. The vendor may thus request that the local authority shall sample in turn the milk being supplied to him, or the sampling officer may require from him the name and address of his supplier. There is a time limit of 60 hours in which the vendor may make his request, and if he gives the required statement of time and place of delivery of milk from a corresponding milking, he may ask for a sample to be taken from that consignment in course of transit. The details of these procedures are to be found in Part II of the Seventh Schedule to the Act. In his turn the consignor may make a request within 60 hours for milk samples to be taken direct from a corresponding milking of the cows. In this last case the sampling officer may make provision for satisfying himself

that the sample is a fair one, taken from cows properly and fully milked. This is what is called an "Appeal-to-Cow" sample.

In Lancashire, the sampling officers usually take the appropriate "follow-up" and "appeal-to-cow" samples whether or not a formal request is made for them.

"Appeal-to-Cow" Samples

The samples taken directly from a corresponding milking of the cows concerned with such a previous sample are termed "Appeal-to-Cow" samples. They should be taken under carefully supervised conditions, which ensure that the same cows are involved (although this is not always entirely possible with modern milking parlours), that dairy equipment is clean and dry and that the milk is not tampered with. The resulting samples' analyses may thus be assumed to be those pertaining to genuine milk. Not only are these samples useful in their function as a final appeal, but they provide the laboratory with information about quality variation from cow to cow, and, as such samples are often taken in connection with suspect milk, they provide an interesting guide to the limits to which poor quality milk can fall below the presumptive standards of the Sale of Milk Regulations.

Table 20 gives information about the 16 Appeal-to-Cow samples (all County samples) which were examined in 1972.

Table 20

Analyses of Appeal-to-Cow Samples of Milk, 1972

Number	Num- ber of cows milked	Approx. yield gallons	Morning or Evening	Fat per cent.	Solids- not-fat per cent.	Freezing Point (Hortvet) °C	Taken for comparison with numbers	Observations
E.663	2	2	M	2.20	7.60	-0.540	E.394	Poor in fat and low in solids- not-fat. Poor in fat and low in solids- not-fat
E.664	3	2½	M	2.75	8.30	-0.539		
E.665	1	1	M	4.40	8.55	-0.534		
E.666	1	1½	M	4.05	8.55	-0.537		
E.667	1	2	M	3.30	8.90	-0.544		
E.668	1	1½	M	3.50	7.90	-0.540		Low in solids- not-fat Poor in fat
E.669	2	2½	M	2.60	8.50	-0.535		

Table 20—continued

Number	Num- ber of cows milked	Approx. yield gallons	Morning or Evening	Fat per cent.	Solids- not-fat per cent.	Freezing Point (Hortvet) -C	Taken for comparison with numbers	Observations
772	69	80	E	4.20	8.60	-0.537	N.5598 and N.5599	Poor in fat Slightly low in solids-not-fat
773	14	18	M	2.50	8.50	-0.531		
774	14	18	M	3.70	8.45	-0.533		
775	14	18	M	3.60	8.50	-0.530		
776	69	—	Mixed	3.75	8.55	-0.530		
C.2896	7	8	M	4.25	8.75	-0.539		
C.2897	6	10	M	3.75	8.50	-0.530		
C.2898	1	3	M	3.65	8.80	-0.533		
777	8	4½	E	4.90	7.25	-0.530	N.5845	Low in solids- not-fat

Samples of Milk Deficient in Solids-not-fat but considered to be genuine

Not all unadulterated milk contains as much fat or solids-not-fat as are taken for the presumptive standards of the Sale of Milk Regulations. Such amounts are those which may be taken to put the samples above suspicion. In cases of milk samples which show a fat deficiency, the procedure by which it is ensured that a farmer is not wrongfully prosecuted is that of the Appeal-to-Cow sample, which has already been described. The same provisions also help to establish those instances where poor Solids-not-fat quality may also be due to cattle giving naturally poor quality milk. In this case, however, resort must also be made to the information given by the Hortvet freezing point test. This test makes use of the fact that normal osmotic processes in the udder establish a relationship between the milk and the blood of a healthy animal, and since there can be very little variation possible in the blood there can similarly be very little chance of this particular property of milk showing great variation. In the section of the revised Ministry of Health Memorandum 36/Foods (1939), which deals with the quarterly reports required from public analysts, there is a statement requiring a table to be made of milks of low solids-not-fat content but with genuine freezing points. All poor quality milks are therefore tested in this way in County Laboratory, and the required tables make up a great deal of the volume of the quarterly reports.

During the year under review 141 County samples of milk were found to be poor in solids-not-fat, although they were considered "genuine" by reason of the freezing point test. This figure corresponds to 3.4 per cent of the total milk samples (including appeal-to-cow) submitted by County sampling officers. Last year the number was 9.7 per cent and in the past five years it has varied from 3.4 to 12.1 per cent.

Dirt in Milk

The congratulations extended to the milk trade in the year 1971, when only 23 complaints about milk were received in the laboratory, needed to be withdrawn for 1972, since forty-five such complaints were received in that year. Fourteen of those resulted in prosecutions.

Udder washings, which are usually what is referred to as "Dirt" occurred with only three of the samples, but the former limit of two parts per hundred thousand parts of the milk was exceeded only in sample 569, submitted from an autonomous authority. All three occurrences were dealt with by means of cautions. Blood was present in sample 82, but as few leucocytes were present, this was considered to be due to a teat injury and not to mastitis. Sample C2687 was labelled 'Long life' and was within its recommended sales date, but it was sour and was supporting a considerable growth of bacteria. Bacteriological taint occurred in complaint samples S425, N5112 and N5113, E174 and 1729, and mould (almost always mould which had been growing on milk residues left in the bottles) occurred in samples S8988 and S9817 (both of which also contained extraneous water) 8842, C21/72 and C2901. All but samples 8842 (which came from an outside authority) and C2901 (which was referred to the local authority within whose area the event had occurred) were dealt with by prosecution.

Insects were present in samples S8794 (brown housemoth larva) C1732 (earwig) E269, 53/72, 167 and 114 (*drosophila* puparia adhering to inside surfaces of the bottles). All but the earwig failed to reach court, and so did a bottle numbered 53/72 containing a fly puparium, two pieces of adult insect and part of a larva, an insect egg, yeasts and bacteria in a film of dry milk residue over most of the inside surfaces. Sample E660 contained two beetles—*Trigonogenius globulus* from an animal feeding stuffs infestation, and *Typhaea stercorea* or hairy fungus beetle . . . (the sample was also deficient of 40 per cent of its fat content) but as the complainant was unwilling to give evidence there was no prosecution.

Other biological debris was found in samples E9454 (woodlouse), E9455 (earthworm), N4758 (common mouse—the sample also contained extraneous water) and 1693. The last sample contained avian excrement, but a combination of another delay in reporting and the inspector's belief that it had been a slug, somehow resulted in the matter having been brought to an informal conclusion before the laboratory findings had become known. The mouse is illustrated in plate 1 and it cost the dairy £100 fine with £13 costs.

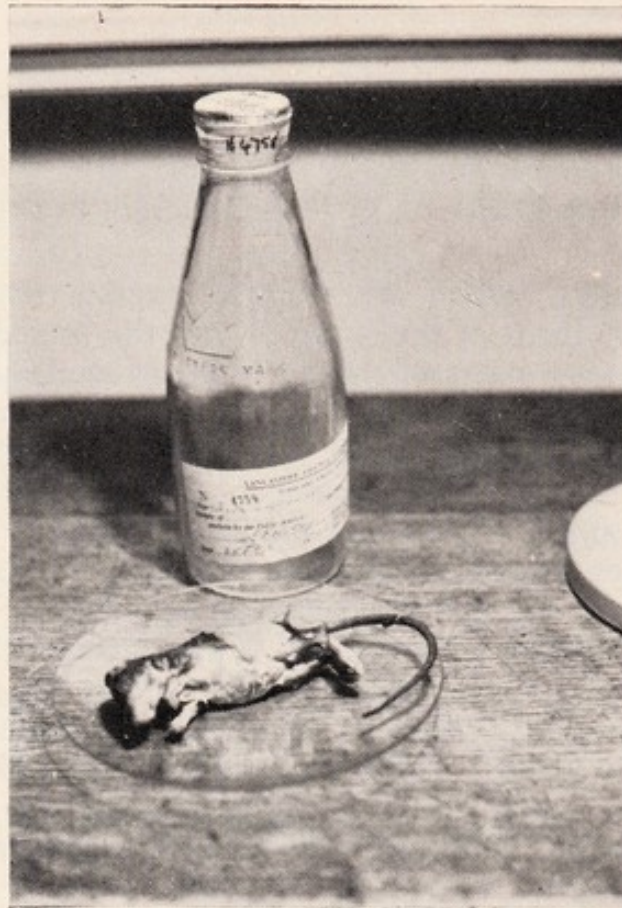


PLATE 1 Mouse and milk bottle

The list of the more interesting of other materials occurring in milk bottles during 1972, ought to begin with a horse, which occurred in sample S9315. It was, of course, a model horse, made from a co-polymer, and it weighed only 0.825 gram—but it was springy enough to be pushed into the sterilised milk bottle in which it occurred and was rigid enough to resist removal. There was no doubt about its having been processed with the milk, for there was still a 13 inch vacuum in the headspace of the bottle when it was submitted to the laboratory, but as the object was clean and sterile, it was decided not to prosecute. Essentially the same might be said of sample S9352, in which another breakfast food model occurred. This was a polyethylene model of a knight in armour, weighing 3.25 grams. It is illustrated in plate 2. The two kinds of graven image were found



PLATE 2 Plastic knight and milk cap

occurring together in sample E761, which contained a toy horse and rider. Breakfast food manufacturers seem to consider such models to be equivalent in sales appeal to claims for vitamins. Perhaps they are good for us! Sample N5105 contained potato peelings and tea leaves, and sample N4872 contained part of a jigsaw puzzle. In these cases the complainants did not wish to give evidence. Sample C1737 contained the imitation cork tip paper from a smoked cigarette, but there was no evidence whatever that the rest of the tip had ever been in the milk. A curious feature of this paper was, that though it was impregnated with lactose, it seemed to have absorbed none of the milk protein. It may therefore have originally been stuck by sour milk in which the protein had been insoluble to the inside of the bottle. The foreign matter from sample S9895 was brought to the laboratory screwed up in a piece of aluminium foil. It consisted of milk solids containing hardboard fragments and rust. Little could be said about its association with the bottle, and as it was also suggested that the complainant had only come to the local authority after having tried to intimidate the dairy, the matter was dealt with by caution. Cardboard recurred in samples E9204 and E803 . . . the latter piece being marked "No milk today thank you" . . . and a small piece of emery wheel was glued to the bottom of milk bottle M038 by a deposit of stale milk solids.

There is quite a deal of luck about what happens when foreign matter gets into milk bottles. As may be seen from some of the foregoing instances, if the recipient complains at all, he might change his mind about going to

court; an inspector might deal with it casually, or somebody along the chain of getting the information laid may forget that there is a time limit within which action must be taken. Having reached court, the matter runs the gauntlet with the magistrates' prejudices or those of the clerk of the court. The case which resulted from sample S9314 having been found with cigarette packet wrappings inside the bottle was heard in an Anti-motorist court. In a preceding case a motorist who had been involved in an accident in which the cars had not actually touched was fined £70. The case was followed by somebody fined one pound for failing to have a T.V. licence, and although the presence of cigarette packet-wrappings represented the third offence of the dairy concerned, their fine was only £20.

Broken glass was involved in the cases of samples C2466, M847, M294, C300, S280 and 8940, all of which resulted in successful prosecutions. There was also a prosecution with sample M5 which contained cement mortar.

Samples M207, M238 and M478 were specimens of dirty milk bottles, involving mould growth, cement and old milk residues respectively.

The laboratory also finds itself involved from time to time in the collection of data, as a result, it seems, of long chains of secondary requests which filter in all directions, after (one presumes) the Ministry puts an initial request to the County Councils Association, the AMC or perhaps to LAJAC. These requests seem then to reach various inspection departments, and sometimes they even reach the Association of Public Analysts, and the requests beat upon the laboratory like echoes from a shot fired in the Grand Canyon. Unfortunately the last echoes are sometimes still occurring long after whoever fired the shot has forgotten all about it . . . so that the results of some of these requests then hang upon the air like the silence which precedes a storm. Although, therefore, it is now clear that nobody wanted the results, the laboratory accumulated a number of results for the occurrence of lead residues in milk. At least it established that English cattle do not derive their calories from leaded petrol, because the range of results went from nothing at all to a maximum of 0.006 parts per million . . . the average (for what it is worth) being 0.002 ppm.

Perhaps the paragraph on extraneous matter in milk is not the place to mention one feature which occurred often enough to cause remark, but it was never put on a quantitative basis. This involved the head space in capped one pint bottles. 1972 left an impression that many more bottles than in former years were incompletely filled. The worst sample was sample C2325 which came in two portions—the chemical portion proved to be of short measure by the more familiarly occurring margin, containing 19.4 fluid ounces instead of 20 fluid ounces—but its companion bottle, the portion submitted for phosphatase testing, contained only 18.6 fluid ounces. The laboratory would like to record its opinion that when head-space reaches 1.4 fluid ounces in a nominal one pint bottle it ought to be regarded as extraneous matter.

Antibiotics in Milk

Farm milk has been tested since 1962 in County Laboratory for the presence of antibiotics. A report "Antibiotics in Milk in Great Britain" was published in 1963 by The Milk Hygiene Sub-Committee of the Milk and Milk-Products Technical Advisory Committee, which was set up in 1954 by the Minister of Food, The Minister of Agriculture and the Secretary of State for Scotland. The report warned that 11 per cent of the milk samples taken on behalf of the sub-committee in 1961 had contained small residual amounts of penicillin, left after direct treatment of inflamed conditions of the udder with antibiotics in oily suspension. These preparations of penicillin were supplied in collapsible tubes for direct injection into the milk ducts. Farmers were warned to withhold milk obtained from the animals so treated, and were told not to sell any milk from those cows until sufficient time had elapsed for the residual amounts of antibiotics to clear from the udder.

From May 1963 on, all the milk samples submitted to the laboratory have been tested for antibiotics, including the heat treated milks and Channel Islands milks. The Milk Marketing Board operates a penalty scheme which provides for two warnings, to be followed by a price reduction, and this scheme seems to have reduced the incidence of penicillin residues in milk very considerably.

During the year under review all the milk samples submitted to the laboratory have been tested for the presence of antibiotics but only eleven samples were reported as having contained any. This is because the laboratory normally only reports quantities in excess of the 0.04 international unit per cubic centimetre quantities which are said to affect cheese starters in the making of cheese. In fact, however, a further 33 samples were found to contain smaller quantities than this. In both categories, the ratio of occurrences in untreated milk and heat treated milk was 1:2.

No cases were taken to court. The highest amount of penicillin found, namely 0.15 units per cm³, occurred in an informal sample. The follow-up formal sample was found to be free from penicillin.

HEAT-TREATED MILK

The Milk (Special Designation) Regulations 1963, The Milk (Special Designation) (Amendment) Regulations 1965, The Food and Drugs (Milk) Act 1970 and The Milk Special Designation (Amendment) Regulations 1972

The above-mentioned regulations were made under the empowering Section 35 of the Food and Drugs Act 1955, and are referred to in Sections 43(3), 87 and 123. The special designations to which the regulations refer are "untreated", "pasteurised", "sterilised" and "ultra heat treated". The Food and Drugs (Milk) Act 1970 extended Section 32 of the Food and Drugs Act 1955 to allow milk to be sterilised by direct steam injection, and the latest Amendment Regulations (SI 1972 No. 1117) amend the previous Amendment Regulations of 1965, by prescribing additional conditions

under which licences may be granted when use is made of the provisions of the Food and Drugs (Milk) Act 1970. The conditions specify that the composition of the milk must not be changed by the steam injection process, and they limit the chemicals which may be used as boiler water treatment chemicals in the water used for generating the steam which will be applied to the milk.

The manner in which the Special Designations operate is as follows. Section 37 of the Food and Drugs Act makes it obligatory to use a special designation when milk is sold by anyone. Section 36 prohibits the use of a special designation by anyone who does not hold a licence authorising use of that designation, and the licences are issued according to procedures laid down in the Milk (Special Designation) Regulations 1963 (as amended). Holders of "Producers Licences", which are issued by the Ministry of Agriculture, Fisheries and Food, may only sell milk from their cows to Heat Treatment plants. There is a provision for direct sale of small quantities of milk to members of the public who call at the farm, but apart from the automatic authorisation to use the designation "Untreated" for this purpose, they may otherwise only sell direct to the public if they also hold a local authority licence to retail milk to which a special designation applies. Those who hold both licences are Producer-retailers, and those who hold only a local authority licence are Retailers.

There are proposals for use of a statutory colour code for milk bottle caps which will enable the different kinds of milk to be recognised at a glance, but this coding is not yet in universal use. The code advocated is:—

Channel Islands Milk	Gold Lustre Cap
Pasteurised-Homogenised Milk	Red
Pasteurised	Plain aluminium
Untreated	Green
Sterilised	Distinguished by bottle shape
U.H.T.	Marked on cartons

The information which must be given when milk is sold may either be marked on the bottle or embossed on the cap, but until the abovementioned colour code is in use it is possible for a plain bottle to acquire a plain cap of a colour which has no significance whatever.

There were three samples, namely samples C1771, C1772 and E666 sold in the year 1972 as "pasteurised" when they were in fact "untreated" milk. Despite the concern which was felt at the time about risk from brucellosis, the magistrates imposed only small fines in each case.

The only other peculiar occurrence with heat treated milk in the year 1972, was with a relatively new product called "Extra Life" milk (sample number C2687), which consisted of a U.H.T. milk, packed in a laminate carton which had previously been sterilised with hydrogen peroxide. It was submitted on 6th November, and it bore a statement "Consume by 11 Dec" . . . but it was found to be sour and supporting a considerable

bacteriological flora. The reason was probably damage to the carton, but although the laboratory searched carefully for the perforation it was unable to reveal it.

The Milk (Special Designation) Regulations also attempt to ensure that milk is in reasonably fresh condition when it is delivered, and for that reason a prescribed methylene blue test is incorporated into the examination to which milks submitted under these regulations must be subjected.

During the year, 1,833 samples of heat treated milk were submitted specifically under the regulations for examination by the half-hour methylene blue test, the phosphatase test or the turbidity test prescribed in the Milk (Special Designation) Regulations, 1963. In addition, there were three methylene blue tests, three phosphatase tests and five turbidity tests performed for autonomous authorities. The samples tested by phosphatase tests or turbidity tests were all marked either "pasteurised" or "sterilised". Tables 21, 22 and 23 give particulars of the results obtained on the County samples. It will be seen that four samples failed the half-hour methylene blue test and seven samples of pasteurised milk failed the phosphatase test. Three of the seven samples which failed the phosphatase test were taken at pasteurising plants but none of the three samples which failed the half-hour methylene blue test was from a pasteurising plant. In addition, one hundred and fifteen samples of untreated milk were submitted to the half-hour methylene blue test, and of these, one sample failed the test.

The results of the prescribed tests are summarised in Tables 21, 22 and 23.

Table 21

Phosphatase Tests, 1972

Type of Milk	Number submitted	Number unsatisfactory			
		Group 2	Group 3	Group 4	Total
Pasteurised	1,264	2	1	4	7

Table 22

Half-hour Methylene Blue Tests, 1972

Type of Milk	Number submitted	Number unsatisfactory
Pasteurised	1,263	3
Untreated	115	1
Totals	1,378	4

Table 23
Turbidity Tests, 1972

Type of Milk	Number submitted	Number unsatisfactory
Sterilised 	454	Nil

FOOD SAMPLES OTHER THAN MILK

Adulteration of Food other than Milk

During the year under review 2,585 Food and Drugs samples other than milk were examined for the County. Of these 398 samples were criticised, amounting to a so-called 'adulteration rate' of 15·4 per cent. This is higher than in the year 1971 when it was 13·6 per cent. It is higher than the adulteration rate for milk, which was 6·2 per cent, but a large number (namely 63) of these samples was made up of samples incorrectly labelled, and a further six consisted of preserved sausages for which there was no notice displayed to inform purchasers that they contained preservatives. The general public also contributed to this high return by its constant interest in extraneous matter in food. There were 133 County samples containing extraneous matter, 62 containing insects (or parts of other small creatures) and 44 affected by moulds or other micro organisms. If allowance is made for all these samples, the 'adulteration rate' for food is dramatically reduced to only 3·5 per cent.

Table 24 gives a list of articles other than milk which were submitted by County Sampling Officers and were found to be unsatisfactory. Particulars of the irregularities and of the action taken appear in the last column of the table.

Table 24

Samples other than Milk, Adulterated or otherwise giving rise to Irregularity

Note: Legal proceedings (where applicable) were taken under Section 2 of the Food and Drugs Act, 1955, unless otherwise stated.

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.8784	Cream Cheese with Herbs	Informal	Labelled Fresh Cream Cheese with Herbs. Fat content only 35·6%. Herb content of the order of 2%. Fat content of cream cheese should not be less than 45%. Label also marked 70% milk fat - should indicate that the declaration refers to per cent fat expressed on the dry matter.	Manufacturer communicated with.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.1700	Sarsaparilla bottle and dregs	Complaint	The deposit weighed approximately 0.1 gram. It was identical with material soluble in hot water which deposited in the cold from and extract of liquorice, and it was further coloured with the permitted coal tar colours for food use Chocolate Brown FB and Tartrazine.	Complainant informed.
C.1717	Part Sliced Loaf of Bread	Complaint	Contained part of circular white sealing ring, made from polybutadiene, and weighing 6.03 gram, together with a small piece of the same material weighing 0.02 gram.	Bakery cautioned and complainant informed.
E.9271	Chopped Pork and Ham, canned	Informal	Meat content 81.0%. Should be labelled Luncheon Meat.	Importers communicated with. Remainder of stock withdrawn.
E.9274	Tomato Sauce	Informal	Bottle cap so corroded that bottle neck of sample broke before the cap moved.	Stock examined and unsatisfactory bottles withdrawn from sale.
E.9275	Non-fat Milk	Informal	The appropriate designation required by the labelling of Food Regulations, 1970, Schedule 5, paragraph 5(2) is Dried Skimmed Milk or Dried low-fat skimmed milk.	Same manufacturer as N.3895.
C.1758	Portion of Beefburger	Complaint	Contained a fragment of hide bearing bovine hairs (probably from the lip) which weighed 0.27 gram.	Manufacturer and complainant informed.
C.1759	Part Packet Fish Fingers	Complaint	Contained one dead and sterile cod worm (<i>Porrocaecum Decipiens</i>) weighing 19 milligrams. Model purchase specifications for use of Education Authorities issued by the White Fish Authority were prepared to accept three such worms per half stone.	Manufacturer informed and taking steps to prevent a recurrence. Complainant re-assured.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.9299	Fresh Minced Meat	Informal	Contained 37 parts per million of sulphite preservative (expressed as sulphur dioxide). Minced meat is not a specified food allowed to contain preservative under the Preservative in Food Regulations, 1962.	Vendor cautioned. Further formal sample genuine.
S.8798	Gravy Salt	Informal	Container corroding.	Shop in which commodity purchased has now ceased business.
S.8801	Pasta All'Uova	Informal	The name of the food "Pasta all'Uova" should be rendered in a equivalent English sufficient to be understood, i.e. Vermicelli with Egg.	Distributor communicated with.
S.8812	Fish Fingers	Complaint	Contained a piece of fish skin weighing 41 milligrams.	Complainant informed.
N.4716	Part Packet Potato Crisps	Complaint	Contained 9.96 grams of pieces of cooked potato held together by edible fat but stained with 1310 parts of iron in a million of the food and 80 parts per million of copper.	Manufacturer cautioned and taking steps to prevent a recurrence. Complainant informed.
N.4721	Part Meat Pie	Complaint	Contained three strands of twisted wire weighing in all 58 milligrams.	Fined £30 and £3 costs.
N.4720	Sausage	Complaint	Contained a wound dressing weighing 0.62 gram.	Fined £10 and £10 costs.
E.9358	Flour	Complaint	The sievings submitted with the sample (weight 1.2 gram) and approximately 0.36% of the 15 oz. sample itself consisted of small spherical aggregates of flour contaminated with approximately 8% of mineral oil, 6% of other oil and 0.05% of colloidal iron – suggesting that a splash of machine lubricant had become dispersed in the food.	Supplier notified.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.9382	Sugar Confectionery	Complaint	Contained 16 mgms. of carbonised sugar.	Bakery and complainant informed.
S.8820	Sausage with Bacon and Bread	Complaint	Contained one used cigarette filter tip weighing 0.239 gram.	Complainant unwilling to give evidence.
S.8821	Bread	Complaint	Contained a small damaged fly weighing 1 mgm. and measuring 4 mm. in length. Chemical tests indicated the fly had not been subjected to heat treatment.	Bakery cautioned and taking steps to prevent a recurrence. Complainant informed.
S.8822	Cake	Complaint	Contained parts of a damaged fly weighing 2.5 milligrams.	Fined £20 and £13 costs.
N.4723	Spaghetti Bolognese, canned	Informal	Contained 270 parts per million tin. Recommended maximum limit 250 parts per million.	Remainder of stock withdrawn.
C.1766	Ginger Ale	Complaint	Contained pieces of dead fungal mycelium and colonies of fungus were attached to sides of bottles.	Fined £30 and £9 costs.
C.1767	Limeade	Complaint	Ditto	
E.9398	Fruit, canned	Complaint	Contained a cooked beetle of the family Tenebrionidae which weighed 34 milligrams.	Importer cautioned. Taking steps to prevent a recurrence.
S.8861	Ham and Cheese Toast Toppers, canned	Informal	The sample could be held to conform to the definition of "Meat Paste" in the "Fish and Meat Spreadable Products Regulations". Advised at the next printing of the labels to use the wording of Regulation 6 in the design (i.e. Requires Grilling).	Manufacturer advised.
C.1721	Crumpets	Complaint	Contained a tin plated mild steel cap from a metal polish container.	Bakery Manager interviewed and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.1722	Salami	Complaint	Contained two pieces of cooked hide bearing cow hair. They weighed 0.67 gram and 0.27 gram and had probably originally been one piece.	Importer cautioned and taking steps to prevent a recurrence. Complainant informed.
C.1723	Pickled Herrings, bottled	Complaint	Contained five pieces of broken clear glass weighing in all 9.622 grams.	Manufacturer cautioned and taking steps to prevent a recurrence. Complainant informed.
C.1725	Steak with Gravy, canned	Complaint	Contained two small pieces of hide with attached bovine hair together with loose hairs scattered throughout the cans.	} Remainder of stock withdrawn.
C.1726	Steak, canned	Complaint	ditto	
E.9415	Shandy	Informal	Contained 3.4% proof spirit due to the activity of fermenting yeasts.	Remainder of stock checked and found to be satisfactory.
C.1768	Part packet of Alpen	Complaint	The foreign material submitted with the sample consisted of a splash of Ethylene/vinylacetate copolymer which weighed 0.97 gram — no obvious contamination of the food itself.	Manufacturer cautioned and complainant informed.
S.8886	Part Pie	Complaint	Contained a piece of galvanised iron wire weighing 123 milligrams.	Complainant unwilling to give evidence.
C.1770	Part Jar Baby Food	Complaint	The grub submitted was a larva of Brown Housemoth (<i>Hofmannophila Pseudospretella</i>) but it was still alive and could not have been associated with the food.	Matter referred to local authority concerned.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations						
C.1773	Part Black Pudding	Complaint	Contained the brass case of a spent 0.22 inch Cartridge which had been rim-fired, weighing 0.715 gram.	Fined £20 and £13 costs.						
N.4727	Part Potato and Meat Pie	Complaint	The foreign matter submitted with the remains of the pie consisted of a piece of ligament from the meat. It weighed 0.104 gram.	Pie Maker and complainant informed						
C.1774	Health Food (Garlic Pearles)	Complaint	Diluting oil stated on box to to be groundnut oil but sample made up in corn oil.	Manufacturer modifying label.						
C.1775	Portion of Chocolate	Complaint	Contained approximately 0.19 gram of disorganised masses of Cocoa bean debris – (parenchyma, vascular tissue, stone cells) in the form of a deposit.	Importer communicated with and complainant informed.						
S.8941	Chicken Leg (frozen)	Complaint	The blood in an internal blood vessel was still fluid and the inner meat gave both phosphatase and catalase tests, i.e. the meat was insufficiently cooked, otherwise genuine.	Complainant informed.						
C.1777	Chicken, frozen	Informal	Salmonella organism isolated, probably Salmonella agona from Gizzard.	Referred to Public Health Laboratory Service for examination and report.						
E.9479	Pork Sausage	Informal	<table><tr><td>Lean Meat</td><td>28.5%</td></tr><tr><td>Fat</td><td>40.5%</td></tr><tr><td>Total Meat</td><td>69.0%</td></tr></table> <p>Pork Sausage should contain not less than 32.5% lean meat and not less than 65.0% total meat.</p>	Lean Meat	28.5%	Fat	40.5%	Total Meat	69.0%	Vendor interviewed and cautioned.
Lean Meat	28.5%									
Fat	40.5%									
Total Meat	69.0%									
E.9483	Lettuce	Informal	Contained Penta Chlornitrobenzene 6.8 parts per million. Netherlands limit for penta chlornitrobenzene on lettuce 3 p.p.m.	Source could not be traced, therefore no further action taken.						

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.9486	Flour Confectionery	Complaint	The piece of foreign matter submitted with the cake was a piece of PTFE film.	Bakery cautioned and complainant informed.
C.1780	Opened tin of Corned Beef	Complaint	Contained 0.735 gram of coagulated blood.	Complainant informed.
N.4745	Oranges	Complaint	Surface bore a quantity of material of the nature of shellac approximating to 0.1 gram on the surface of the orange.	Complainant informed.
E.9501	Lettuce	Informal	Contained Thiram in the three lettuces amounting to 188 p.p.m., 188 p.p.m., and 296 p.p.m. (i.e. average 225 p.p.m.) Netherlands limit 3 parts per million, U.S.A. limit 7 parts per million.	Referred to local authority in whose area the sample was marketed. Traced to Grimsby
E.9511	Bread	Complaint	Contained 0.13 gram of dirty unrisen dough stained with 0.8 milligram of iron (as Fe) and 27 milligrams of mineral oil.	Bakery cautioned and complainant informed.
S. 8987	Curry Flavour Crisps	Complaint	Contained light greyish-brown lumps of soft material consisting of iron-stained, somewhat fatty potato crisp material. It weighed $6\frac{2}{3}$ gram and contained 950 parts per million of iron and 1% of fine silicious material.	Manufacturer cautioned and complainant informed.
S.8995	Spaghetti Napolitan, canned	Informal	Protein on the dry spaghetti only 11.2% (2.0% on the spaghetti as eaten), i.e. no different from the pasta in other brands of canned spaghetti – therefore claim on label "protein rich pasta" not justified.	Importer communicated with.
S.8998	Sausages	Complaint	Deficient by 6 per cent of the minimum required meat content, and deficient by 4.5 per cent of minimum lean content. Sample also contaminated with iron staining.	Complainant unwilling to give evidence.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.4751	Part of Chocolate Coated biscuit	Complaint	The crushed larva on the base belonged to the <i>Ptinus</i> species of beetles (probably a larva of <i>Niptus hololeucus</i> at the time of the year). It weighed 1 milligram.	Vendor cautioned and remainder of stock examined for infestation.
C.1727	Drinking Chocolate	Complaint	Contained a dead male Tropical Warehouse Moth weighing 3 milligrams together with insect webbing and frass, weighing 58 milligrams.	Manufacturer cautioned and complainant informed.
S.9046	Strawberry Tart	Complaint	Contained a distorted iron-wire staple of overall length 30 millimetres and weight 0.37 gram. Also contained three pieces of strawberry calyx and a leaf from another plant.	Complainant informed and confectioner to demand cleaner fruit.
N.4763	Part Eccles Cake	Complaint	Contained two pieces of fatty coarse dark grey coloured cardboard together weighing 3.3 grams.	Bakery cautioned and complainant informed.
C.1728	Single Cream	Informal	Only labelled Pure Fresh Cream. From 1st March 1972 should also have borne the word "untreated" (Cream Regulations 1970, Regulation 4 (2)).	Vendor communicated with.
C.1729	Double Cream	Informal	Only labelled "Double Cream". From 1st March, 1972 should also have borne the word "Pasteurised".	Vendor communicated with.
C.1730	Chip Straws	Complaint	The foreign object submitted with the sample consisted of a piece of fabric and rubber laminate (object of complaint) weighing 2½ grams.	Manufacturer carrying out investigation. Complainant informed.
S.9040	Self Raising Flour	Complaint	The foreign matter submitted with the sample consisted of several pieces of fried onion (edible fat content 10.9 per cent) which weighed in all 0.165 gram.	Millers representative informed, complainant also informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9119	Stewed Steak (canned)	Complaint	Contained 3·2 grams of bovine hair matted with stratified epithelium (dandruff) which with 1·9 grams of fat and 2·7 grams of moisture made a greasy hairy mass in the food, weighing 7·8 grams.	Importer cautioned and complainant informed.
C.1731	Bread	Complaint	Contained three particles of iron-stained and unrisen dough, together with stained breadcrumb forming a dark streak in the loaf, the total weight of stained crumb amounting to about 1 1/5 gram containing iron stain equivalent to about half a milligram of iron.	Bakery cautioned and complainant informed.
E.9605	Vegetables, canned	Complaint	Contained a ground beetle (family Carabidae) weighing 0·104 gram. It had been cooked.	Importer cautioned and complainant informed.
E.9619	Dairy Ice-Cream	Informal	Label not in accordance with the requirements which will apply from 1st January, 1973. (1) Designation not sufficiently specific or conspicuous. (2) The traces of fruit ingredient in the ice-cream not included in the list of ingredients. (3) The reference to the single ingredient "Double Cream" will mean that all ingredients must be declared.	Manufacturer modifying label.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9135	Buttermilk	Informal	(1) Fat content 0.1% yet labelled "Fat free". (2) Bears a statement "Helps to keep you slim" without complying with the conditions in Regulation 24(1) (b)(i) (ac) of The Labelling of Food Regulations, 1970. (3) Is labelled "Buttermilk" yet consists not of Buttermilk but of cultured skimmed milk. Should be labelled "Low fat artificial buttermilk" and bear a statement that it cannot aid slimming except as part of a calorie controlled diet.	Manufacturer agreed to amend labels.
S.9184	Biscuits	Complaint	Contained a Lesser House Fly (<i>Fannia canicularis</i>) weighing 3 milligrams, baked into the surface of one of the biscuits.	Importer cautioned and complainant informed.
S.9186	Bread	Complaint	Contained a pellet of wheaten char weighing 94 milligrams.	Bakery and complainant informed.
S.8644	Granulated Sugar	Complaint	Contained 4 milligrams of oil with the nature of lubricating oil.	Packer cautioned and complainant informed.
S.8654	Part Consumed Choc. Ice	Complaint	Contained alkaline sodium silicate cleaning powder.	Manufacturer taking steps to prevent a recurrence.
S.8646	Lemonade	Complaint	The sample consisted of nothing but carbonated water (i.e. 100 per cent deficient in sugar content, etc.) – but apart from its flat and therefore unusual taste it should not have been responsible for illness.	Manufacturer cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.8647	Bread Rolls	Complaint	The piece of galvanised iron wire inserted into the bread did not appear to be in its original position and it had been virtually cleaned, possibly by being moved about in the bread. It measured 59·5 millimetres in length and 1·8 millimetres in diameter and it weighed 1·175 grams.	Bakery cautioned and complainant informed.
E.9676	Bread	Complaint	Contained 0·181 gram of unrisen dough rolled into cylindrical pieces lightly stained by approximately 0·5 per cent of hydrated oxides of iron.	Bakery cautioned and complainant informed.
N.4770	Part Loaf of Bread	Complaint	Contained a dark inclusion weighing 0·009 gram consisting of white bread-crumbs attached to a small flake of paint.	Bakery cautioned and complainant informed.
S.8649	Baked Beans in Tomato Sauce, canned	Complaint	The foreign matter submitted with the remaining beans consisted of a bunch of jute fibres weighing 0·206 gram. They probably had been in somebody's mouth. There was nothing harmful found in the remaining beans.	Manufacturer cautioned and complainant informed.
S.9187	Lemonade	Complaint	Contained 21 milligrams of a hydrocarbon oil of the nature of petroleum spirit.	Complainant informed and bottler cautioned.
S.9191	Pork Sausages	Complaint	Sample consisted of eight sausages which were all affected by active mould growth.	Matter referred to local authority concerned.
S.9192	Sliced Pineapple, canned	Complaint	Contained a fragment of blackboard chalk (length 2 centimetres, diameter 0·8 centimetre) resting on the top of the fruit. Its dry weight was two thirds of a gram.	Importer cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.1804	Part Tin Baby Food	Complaint	Contained a matt of mould measuring 18 millimetres x 28 millimetres x 0.5 millimetres caused by perforations in the can made by a carton opening knife.	Retailer cautioned about his method of opening boxes and complainant informed.
E.9684	Petroleum Jelly, B.P.	Complaint	Contained Thymol 0.15 per cent. Thymol is not an ingredient of official White Petroleum Jelly B.P.	Fined £30 and £15 costs.
E.9685	Petroleum Jelly, B.P.	Informal	Contained Thymol 0.15 per cent without declaration. Thymol is not an ingredient of White Petroleum Jelly, B.P.	Advised that manufacturer withdraw the batch. Sample purchased in connection with No. E.9684.
E.9686	Chicken Soup, canned	Complaint	Contained a third of a gram of a mineral grease amounting to 0.23 per cent of mineral hydrocarbon in the sample.	Complainant informed.
E.9296	Channel Islands Milk	Informal	Contained 0.05 I.U. penicillin per cm ³ .	Producer informed. Investigation carried out by dairy and producer's milk found to be clear.
Orrell U.D.C. 3/72	Lemon Filling, dry	Informal	The name of the food "Lemon Filling" is not a sufficiently specific "appropriate designation" to indicate to a purchaser the true nature of the food.	Manufacturer advised to re-design label before 1st January 1973 possibly to read "Lemon Pie Filling Mix".
Orrell U.D.C. 5/72	Grapefruit Juice, canned	Informal	(1) Minor mineral constituents appropriate only to a Grapefruit Drink (containing approximately 7 per cent of juice). (2) Tin content 135 parts per million. Recommended limit 250 parts per million.	Importer advised to ascertain true nature of the drink and take steps to label product as a "drink".

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
Preston R.D.C. 1	Dates	Complaint	Contained one live moth larva of <i>Ephestia cautella</i> weighing 22 milligrams.	Iraq Dates Trading Company informed. Old stock. Complainant informed.
Preston R.D.C. 2	Meat Pie	Complaint	Contained mould and fungus and found to be unfit for human consumption.	Legal proceedings not taken due to unsatisfactory chain of evidence.
Preston R.D.C. 3	Meat Paste (Chicken)	Complaint	Heavily infested with actively growing fungus of a <i>penicillium</i> species due to a fracture of the glass jar.	Retailer cautioned and complainant informed.
Whiston R.D.C. 913	Sherry	Informal	Contained excess copper and zinc from pourer.	Brewery Managers interviewed and all offending pourers withdrawn from use.
Whiston R.D.C. 916	Rum	Informal	Contained 5·8 per cent of added water and 10 parts per million of copper and 8·5 parts per million of zinc from pourer (copper and zinc both exceeding the recommended limits).	Brewery Managers interviewed and all offending pourers withdrawn from use.
Whiston R.D.C. 917	Vermouth	Informal	Contained 14·5 parts per million copper and 12·5 parts per million zinc from pourer (both exceeded the recommended limits).	Brewery Managers interviewed and all offending pourers withdrawn from use.
Whiston R.D.C. 918	Martini	Informal	Contained nickel from the pourer.	Brewery Manager interviewed and all offending pourers withdrawn from use.
Whiston R.D.C. 919	Soft Drink	Informal	Contained excess Copper, from pourer (exceeded limit of 7 parts per million for Copper in concentrated Soft Drinks).	Brewery Managers interviewed and all offending pourers withdrawn from use.
Whiston R.D.C. 920	Soft Drink	Informal	Contained Copper, Lead, Zinc and Cadmium from a pourer in excess of the limits for these metals in concentrated soft drinks.	Brewery Managers interviewed and all offending pourers withdrawn from use.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
Whiston R.D.C. 921	Soft Drink	Informal	Contained Copper, Lead and Zinc from pourer in excess of the limits for these metals in concentrated soft drinks.	Brewery Managers interviewed and all offending pourers withdrawn from use.
E.9704	Pork Sausages	Informal	Meat content 56·0%. Pork Sausage should contain not less than 65·0% meat.	Vendor cautioned.
E.9717	Pork Sausages	Informal	Lean Meat 29·0% Fat 39·0% <hr/> Total Meat 68·0% Pork sausage should contain not less than 32·5% lean meat and not less than 65·0% total meat.	Manufacturer cautioned.
C.1733	Dental Injection Solutions (phials)	Complaint	Slight loss of adrenaline. Packed in clear glass phials.	Complainant notified, and remaining stock replaced with amber coloured phials.
C.1734	Ice Pops	Complaint	Sample affected by mould of a penicillium species.	Manufacturer notified and complainant informed.
E.9726	Apricots, Dried	Complaint	The half pound sample contained two dead ants and one dead fruit fly. (The insects appeared to have gained access before the fruit was dried).	} Remainder of stock withdrawn.
E.9727	Apricots, Dried	Complaint	The half pound sample contained 12 dead ants and one dead fruit fly	
E.9728	Apricots, Dried (In connection with E.9726/7)	Informal	The half pound sample contained 8 dead ants.	
E.9729	Apricots, Dried (In connection with E.9726/7)	Informal	The half pound sample contained six dead ants.	

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.8650	Full Cream Milk Food	Complaint	Contained a fully grown and mature house moth larva.	Manufacturer notified and complainant informed.
E.9760	Minced Meat, Fresh	Informal	Contained 400 parts per million of sulphite preservative (expressed as sulphur dioxide).	See sample No. E.9769.
E.9768	Chocolate	Complaint	Contained approximately 0.14 gram of cocoa material which was stained with black particles of iron oxide amounting to approximately 7250 ppm. of iron (as Fe) in the stained chocolate.	Manufacturer cautioned and complainant informed.
S.9199	Skinless Pork Shoulder (canned)	Complaint	Contained approximately 0.122 gram of meat which was stained green by iron corrosion products from areas of the can. No mould was present.	Vendor and manufacturer advised to check general condition of stock and complainant informed.
N.4795	Lean Ham, canned	Informal	Calculated total meat content only 72% and contained added phosphates (expressed as disodium hydrogenphosphate) 0.75% without declaration.	Manufacturer informed.
S.9263	Dandelion and Burdock drink	Complaint	Contained a chicken bone (tibia) partly decalcified (probably by the activity of the soft drink) and deeply stained with caramel, i.e. the colouring used in the drink. It weighed 6.3 grams and measured 9.7 cms. in length.	Manufacturer cautioned and complainant informed.
E.9769	Fresh Minced Meat	Formal	Contained added sulphite preservative (expressed as sulphur dioxide) 320 parts in one million parts of the minced meat.	Regulation 3, Preservatives in Food Regulations, 1962. Fined £25 and £13 costs.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.4797	Crab Meat, canned	Informal	Zinc content 325 parts per million. The Ministry of Food, Food Standards Committee recommendation in 1954 was for a maximum general food limit for zinc of 50 parts per million.	Remainder of stock withdrawn.
C.1735	Cake	Complaint	Sample contained traces of soap probably derived from intraction of fatty acids from fat having a relatively high acid value with alkaline salts in the baking powder used.	Makers supply of fat investigated and complainant informed.
S.9290	Smoked Oysters, canned	Informal	High zinc content. The general recommended limit for zinc in food is 50 parts per million but foods which contain natural zinc may be sold.	Further sample genuine.
E.9808	Beans in Tomato Sauce, canned	Complaint	Contained a "Clay-coloured weevil" (<i>Otiorrhynchus Singularis</i>) – a common garden pest – which had not been cooked.	Complainant informed.
N.4819	Baby Food with fly (Full cream milk Food)	Complaint	The fly was a common housefly (<i>Musca domestica</i>). The fly had been trapped in the box and had died without much subsequent agitation of the packet taking place.	Manufacturer notified and complainant informed.
S.9304A	Finger Roll	Complaint	Contained a vine fruit resembling a currant weighing 0.167 gram.	Complainant informed.
C.1825	Opened Can of Potatoes	Complaint	Tin content 365 parts per million but food appeared to have been kept in the opened can – can seams intact – no evidence of growth of a matt of mould such as occurs when cans are not hermetically sealed.	Complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9304	Chocolate Bar	Complaint	Contained the inner parts of a used cigarette filter tip. being 1·8 centimetres long and weighing 0·404 gram.	Fined £25 and £13 costs.
C.1826	Opened Can of Baked Beans	Complaint	Contained part of a wasp weighing 29 milligrams.	Fined £20 and £10 costs.
N.4837	Beef Casserole with Vegetable and Gravy, Ready Meal canned	Informal	Meat content only 23·5%. The use of the words "Ready Meal" only provide exemption from the 35% meat standard for Vegetable and Meat products when Beef is not the first word in the designation and pictorial illustrations do not indicate that meat is a major ingredient.	Manufacturer communicated with.
E.9883	Ham and Cheese Toast Toppers (canned)	Informal	Label did not bear the words "Requires grilling" as required by Regulation 6 of the Fish and Meat (Spreadable Products) Regulations.	Manufacturer communicated with. Same manufacturer as No. S.8861
C.1827	Part Meat and Potato Pie	Complaint	Contained textile fibres amounting to a total length of 5·2 cms. and weighing in all 2 mgms. consisting of blue nylon and white mixed terylene and cotton, which had been baked into the pie.	Piemaker cautioned and complainant informed.
C.1830	Chocolate Drink	Informal	Unsatisfactory label: no name of the food, no statement of quantity, and list of ingredients in wrong order.	Manufacturer's manager interviewed.
N.4854	Growing Salad	Informal	Labelled "Vitamin Rich" – quantitative declaration of vitamin claimed will become necessary after 1st January, 1973.	Same manufacturer as sample No. E.8347
E.9940	Sauce	Informal	Named only "Family Sauce". The name of the food "Fruit Sauce" will need to be added to the label before 1 January, 1973.	Distributor informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.4857	Lettuce	Informal	Contained Thiram 18 ppm. (Netherlands limit 3 ppm., U.S.A. limit 7 ppm.).	First grower did not use fungicide and second grower had ceased to supply lettuce, therefore further samples unobtainable.
N.4858	Crab Meat, canned	Informal	Sample consisted of three cans. Zinc contents 320 ppm., 400 ppm., and 330 ppm. Recommended maximum limit in food 50 parts per million (natural zinc in crab rarely exceeds 50 ppm.)	Remainder of stock withdrawn from sale.
S.9351	Cooked Cod	Complaint	The sample consisted of a fish cake and not "Cooked Cod" as such. The object submitted with it was a parasitic "Cod Worm" (<i>Porracaecum Decipiens</i>) weighing 16 milligrams. White Fish Authority model purchase specifications permit three such worms per half stone of fish.	Vendor and complainant informed.
E.9929	Coffee Extract, dry	Complaint	Contained 22% of potato starch and 7% of salt probably added as 30% of gravy powder).	Complainant notified.
E.9937	Meat and Potato Pie	Informal	Contained no potato and Total Meat content 30%. Should be named Meat Pie and not Meat and Potato Pie.	Vendor notified.
E.9943	Tomatoes in Tomato Juice, canned	Informal	Howard Mould Count on juice 89% of fields examined contained mould filaments. The tomato juice in which the tomatoes are packed should not contain more mould than would affect 50% of the fields examined.	Importer acquainted with the existence of the Sea and Airport Health Authorities standard for imported tomato juice.
S.9381	Cream Soda	Complaint	Contained frayed fibres mainly from cotton yarn.	Complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9382	Bridge Roll	Complaint	Contained a piece of blue paper (dyed with methylene blue and methyl violet) (measuring approximately $1\frac{1}{2} \times \frac{3}{8}$) and weighing an eighth of a gram, identical with the paper from a salt bag obtained from the bakery.	Bakery cautioned and complainant informed.
S.9371	Spaghetti Dinner with Meat Sauce, dry	Informal	Composite pack (1) Cheese component wrongly labeled. (2) meat content of canned meat filling below limit. (3) Declaration of iron inaccurate.	Importer had ceased purchasing this product.
C.1738	Butter (Same batch as C.1739)	Complaint	Contained a fragment of dirt derived either from a chimney or an oven containing small amounts of finely divided iron with iron oxides and carbon. Its weight was 6 milligrams. The butter had a very strong flavour and odour.	Complainant informed.
C.1739	Butter	Informal	Acid value of fat 2.1 (i.e. at the top limit of the range normally considered to be acceptable), also had a strong odour and taste.	Manufacturer informed.
C.1740	Custard Powder	Complaint	Contained flecks of rust from corroding tinplate on inside of lid and base of container amounting to 855 parts per million of iron in the can.	Complainant informed.
S.9202	Mixed Frozen Vegetables	Complaint	Contained sterile decomposed vegetable matter with abundant fungal material. Probably semi decomposed washings from some of the vegetables. Total weight 0.13G.	Manufacturer and complainant informed.
S.9203	Mineral Water	Complaint	Contained parts of a paper label which had borne the word "Lemonade", the parts together weighing 0.089 gram.	Bottlers cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.25	Barm Cake	Complaint	Contained one male Mediterranean Flour Moth (<i>Ephestia Kuhnella</i>) weighing 2 milligrams.	Fined £30 and £13 costs.
C.1843	Opened tin of Baby Food	Complaint	The matt of mould had a blotted weight of 3 grammes and consisted almost entirely of a <i>Penicillium</i> species – caused by a perforation in the side of the can approximately 5 mm. long probably made with a carton opening knife.	Vendor cautioned about carton opening procedures and complainant informed.
E.37	Flour Cakes	Complaint	Contained one rodent dropping (together with rodent hairs) weighing 10 milligrams.	Fined £15 and £13 costs.
E.38	Rose Hip Syrup	Complaint	Vitamin C content only 30 mgm./fluid ounce compared with 67 mgm. declared – appearance of old stock but no harmful ingredients present.	Manufacturer and complainant informed.
E.47	Sugar with low calorie artificial sweetener	Informal	Labelled “effective sugar replacement for slimmers” without complying with the provisions of Reg. 24 of The Labelling of Food Regulations, 1970.	Packer informed that labels will need to be modified before 1st January, 1973.
S.9456	Bread	Complaint	The bases of the loaves were marked over areas amounting to 56 square centimetres in the one loaf and 72 square centimetres in the other loaf with grey coloured flour stained with approximately three-quarters of a per cent of oxides of iron – probably from the baking trays.	Bakery cautioned and complainant informed.
S.9457	Medicine (on prescription)	Complaint	The grub was a beetle larva of the family <i>Ptinidae</i> which could have gained access almost anywhere. Strength of medicine only approximately 62% Mist Kaolin and Morphine BPC.	Dispenser interviewed and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9467	Beef Sausages	Informal	Contained 370 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed and cautioned.
S.9468	Pork Sausages	Informal	Contained 375 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed and cautioned.
S.9474	Low Sugar, Chunky Orange Marmalade	Informal	Labelled "Specially prepared for diabetics and slimming diets" without complying with the provisions of Regulation 24 of The Labelling of Food Regulations, 1970.	Packer warned that the label will need to be modified before 1 Jan., 1973.
S.9477	Wheatmeal Loaf	Complaint	The cotton yarn submitted with the part loaf had been in the plaited form often found closing flour bags. It had been baked into the breadcrumb which adhered to it and that was of the same kind as in the accompanying loaf. When cleaned it weighed 55 milligrams.	Bakery cautioned and complainant informed.
C.1906	Fresh Cream	Informal	Consisted of pasteurised cream but carton did not bear the word "Pasteurised" as required by Regulation 4(2) of the Cream Regulations, 1970.	Packer communicated with. Cartons now amended to conform with the appropriate regulations.
E.51	Hot Pot Pies	Complaint	Contained two weed seeds resembling a Veronica species, each weighing 9 milligrams – these are very common weeds of arable land and could have been introduced with ingredients.	Bakery notified and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.1919	Fresh Whipping Cream	Informal	Consisted of pasteurised whipping cream. Product bore two labels, one FRESH CREAM PASTEURISED and the other FRESH WHIPPING CREAM. The correct designation required by Regulation 4(1)(c) and Regulation 4(2) is WHIPPING CREAM PASTEURISED.	Producer notified of labelling errors.
S.9205	King Prawn Chow Mein (cooked)	Complaint	The insect parts submitted with the sample consisted of cooked pieces of a fly (family Muscidae) and pieces of a parasitic wasp (family Braconidae), altogether weighing 3 milligrams. Also in the cabbage part of the sample was a piece of slug excrement weighing 25 milligrams.	Proprietor cautioned, complainant informed and Public Health Officer of Local Council asked to investigate food hygiene conditions in the kitchen.
S.9494	Italian Peeled Plum Tomatoes (canned)	Complaint	The leaf in the can was too torn to identify but it was neither tomato nor bay.	Importer notified and complainant informed.
C.1959	Black Cherry Yoghourt, low fat	Complaint	Contained 170 parts per million of benzoic acid preservative. Cherry pulp content not greater than 10 per cent. So carry-over of benzoic acid from this source should not be greater than 80 parts per million N.B. (some of the excess benzoic acid may have been derived from benzaldehyde flavouring added to the cherry pulp).	Importer notified and complainant informed.
N.4876	Boiled Beetroot	Complaint	Slightly undercooked and contained 0.182 per cent of saccharin — together these did produce and unusual taste.	Not labelled as pickled beetroot, should be labelled (see sample N.4877).

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.4877	Boiled Beetroot (for comparison with N.4876)	Informal	Contained acetic acid and saccharin and therefore consisted of pickled beetroots which should be labelled as such, complete with a list of ingredients. Should also bear the name and address of the packer.	Packer interviewed and his attention drawn to 1953 Labelling Order.
S.9500	Liquid extract of Cascara Sagrada	Informal	Alcohol content 13·8% v/v (B.P. limits 21 – 24% v/v). Contained an insoluble deposit. Appearance of old stock.	Remainder of stock withdrawn from sale.
S.9520	Parrish's Food BPC	Informal	Iron and calcium phosphates precipitating on to the glass of the bottle – appearance of old stock.	Remainder of stock withdrawn from sale.
S.9525	Dried Peas – opened packet	Complaint	Contained six booklice, one of which was still alive.	Remainder of stock in sound condition. Check carried out by manufacturer and vendor's premises inspected by district inspector.
E.112	Hot Pot Pie	Complaint	Contained a very corroded wafer of iron or very mild steel measuring 19 millimetres x 8 millimetres x 0·3 millimetres thick and weighing 130 milligrams.	Fined £50 and £18 costs.
S.9905	Chips and Battered Beefburgers	Complaint	Contained one cooked female common cockroach (<i>Blatta orientalis</i>) weighing 0·60 gram.	Fined £10 and £11 costs.
C.1859	Baked Beans (opened can)	Complaint	The foreign material present in the sample consisted of a hard compressed piece of charred bean material weighing 16 milligrams.	Manufacturer and complainant informed.
C.1860	Dubonnet	Complaint	Sample consisted of diluted Dubonnet in which a secondary growth of yeasts was active.	Club Manager and complainant interviewed.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
Fleet-wood Borough 1	Spongecake	Complaint	Contained areas of green mould growth measuring approximately $4\frac{1}{2}$ square inches.	Fined £5 and £23 costs.
Lancaster R.D.C. 1	Sprouting Broccoli (fresh plants)	Complaint	Plants suffering from phosphorus deficiency. No evidence of poisonous material present.	Complainant informed.
Preston R.D.C. 4	Cottage Cheese (low fat soft cheese)	Complaint	Sample mouldy.	Shop Manager cautioned and complainant informed.
Preston R.D.C. 5	Minestrone Soup, Canned	Complaint	Contained two pieces of spaghetti which had been affected by small areas of mould-growth before cooking.	Manufacturer cautioned and complainant informed.
C.1862	Opened can of potatoes	Complaint	The food was putrefying.	Manufacturer cautioned and complainant informed.
S.9917	Rice Krispies	Complaint	The fibrous material in the remaining $1\frac{1}{3}$ ounces of cereal consisted of two human hairs (complete with roots) and twelve very worn hog hairs (probably from a brush) altogether making up a total weight of seven milligrams.	Manufacturer and complainant informed.
E.127	Tomatoes, Canned	Informal	Howard Mould Count: 100 per cent of fields examined contained mould filaments. The juice in which the tomatoes are packed should not contain more mould than would be visible in 25 per cent of the fields examined.	No further stock available.
S.9965	Pink Salmon (Opened Can)	Complaint	The crystals consisted of magnesium ammonium phosphate (struvite) which sometimes separates naturally from canned fish products.	Complainant informed.

Table 24—continued.

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5175	Chocolate Dessert Mix	Complaint	Acid value of the fat extracted from the powder 8.3 – powder had musty flavour but the sealing along the side of this one laminate packet appeared to have been faulty. (Second sample with the same 1313 code number was found to be satisfactory.	Manufacturer taking steps to prevent a recurrence and complainant informed.
N.5179	Portugese Oysters (fresh)	Informal	Zinc content 1020 parts per million.	Ministry of Agriculture, Fisheries and Food informed.
N.5104	Small Wholemeal Unsliced Loaf	Complaint	Contained a piece of five stranded cotton string measuring 16½ cms. in length and weighing 0.165 gram together with grey stained 'white' breadcrumb weighing 0.318 gram containing 0.09 per cent of iron.	Bakery cautioned and complainant informed.
E.152	Bread	Complaint	Contained a mild steel wire nail.	Fined £10 and £18 costs.
E.200	Infant Food, Canned	Complaint	Contained a Centipede weighing 4 milligrams.	Packer taking steps to prevent a recurrence and complainant informed.
S.9559	Cyprus Sherry	Complaint	Contained a yeast sediment equivalent to 0.08% of the sherry. The yeast was inactive and had not affected the flavour.	Packers and complainant informed.
S.9560	Fruit Cocktail (canned)	Complaint	Contained the greater part of a ground beetle weighing 17 milligrams.	Packer cautioned and complainant informed.
S.9576	Sugar with Low Calorie Artificial Sweetener	Informal	Labelled Sugar with low calorie artificial sweetener without complying with the provisions of Regulation 24 of The Labelling of Food Regulations, 1970	Same manufacturer as sample No. E.47.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9578	Short Pastry Mix	Informal	Label gives greatest prominence to illustration of a pie. The words "make a steak and kidney pie" and the name of the food, i.e. "Short Pastry Mix" are equally prominent. Schedule 5, paragraph 5(2) of the Labelling of Food Regulations, 1970, requires that the name of the food shall be conspicuous by comparison with any other matter.	Same manufacturer as sample No.'s E.8974 and C.1532.
S.9599	Dandelion and Burdock	Complaint	Contained deposits of the planktonic alga <i>Asterionella</i> .	Manufacturer cautioned. Remainder of stock withdrawn from sale. Complainant informed. See also Samples No's. S.9661 and S.9662.
S.9600	Pineapple-ade	Complaint		
S.9601	Orangeade	Complaint		
S.9602	Raspberry-ade	Complaint		
S.9603	Limeade	Complaint		
S.9604	Lemonade	Complaint		
E.201	Soft Drink	Informal	Labelled "Strawberry Flavour" but consisted of a soft drink for consumption without dilution. The Labelling of Food Regulations, 1970, require the name of a food to be "sufficiently specific" so notwithstanding the provision which allows the use of the words "Cresta Strawberry Flavour" until 1976 it would be advisable to go beyond the actual wording of the Soft Drinks Regulations and indicate that the food sold is a drink.	Manufacturer agreed to amend labels.
E.204	Flavouring Essence	Informal	Contained the non-permitted colouring PONCEAU MX. The Colouring Matter in Food (Amendment) Regulations, 1970, prohibited the use of Ponceau MX from 1st January, 1971.	Vendor cautioned and remainder of stock withdrawn from sale.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5128	Ice-Cream	Complaint	Contained a resin-bonded wood fibre measuring 4 mm. x 3 mm. x 1 mm. and weighing 2 milligrams.	Producer and complainant informed.
E.222	Cheese and Onion Pie	Complaint	Contained a severely damaged and headless fly (<i>Muscina stabulans</i>) weighing 7 milligrams and measuring 7 millimetres.	Packers cautioned and taking steps to prevent a recurrence and complainant informed.
N.5134	Ham, Canned	Informal	Meat content only 77 per cent and contained added phosphates (expressed as Disodium hydrogen phosphate) 1.1 per cent.	Low in meat content.
E.229	Vegetable Pie	Complaint	Contained a small spider weighing 3 milligrams.	Fined £15 and £18 costs.
C.1742	Bread	Complaint	Contained black stained oily dough and crumb contaminated with 69 milligrams of mineral oil and 67 milligrams of metallic iron.	Bakery cautioned. Complainant informed.
C.1743	Barm Cake	Complaint	Contained discoloured crumb, weighing 10 grams, stained with 310 milligrams of mineral oil.	Bakery cautioned. Complainant informed.
C.1876	Opened Can of Tomatoes	Complaint	Contained a fly (family Muscidae) weighing 4 milligrams and measuring 6 millimetres in length. Chemical tests indicated the fly had been subjected to heat treatment.	Importers cautioned and complainant informed.
N.5085	Cumberland Sausages	Informal	Contained 140 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.268	Mineral Water	Complaint	Consisted of bottle rinsings and not soft drink.	Manufacturer cautioned and complainant informed.

Table 24—continued.

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.1744	Part Loaf of Bread	Complaint	Contained two pieces of rope (made of jute twine), together weighing 0·39 gram. The rope had been baked in the bread and been cut in two during slicing.	Bakery cautioned and complainant informed.
N.5095	Blancmange Powder	Informal	Contained 0·54 per cent salt without declaration in list of ingredients.	Packers informed.
N.5097	Turkey and Ham Toast Toppers (canned)	Informal	Label did not bear the words "Requires Grilling" as required by Regulation 6 of the Fish and Meat (Spreadable Products) Regulations.	Same manufacturer as S.8861 and E.9883.
N.5100	Childrens Cooling Powders	Informal	Recommended as a medicine on label and contained liquorice and magnesium carbonate which were not declared. Both these ingredients could be held to be active, in addition to the paracetamol. All active ingredients of medicines should be declared.	Packers agreed to amend labels.
E.257	Tomatoes, Canned	Informal	Howard Mould Count on juice: 94 per cent of fields examined contained mould filaments. The tomato juice in which the tomatoes are packed should not contain more juice than would affect 50 per cent of the fields examined.	Remainder of stock withdrawn from sale.
C.1881	Bread	Complaint	Contained baked fragments of blue lined notepaper with wording suggestive of bakery instructions, weighing 0·570 gram. The original dimension of the paper having been 4"x 2 $\frac{3}{4}$ ".	Bakers cautioned and complainant informed.
E.295	Danablu Cheese	Informal	Approximately half the surface of the cheese contaminated with an orange coloured bacterial growth. Sample had appearance of old stock.	Remainder of stock examined.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5222	Cheese	Complaint	Contained mould colonies consisting of sporing penicillium species covering an area $2\frac{1}{2}$ " x $\frac{3}{8}$ " and weighing approximately 2.2 grams.	Manufacturer cautioned and complainant informed.
C.1745	Bread Roll	Complaint	Contained the greater portions of the damaged wings (measuring 11 millimetres), the antennae and parts of four legs of a moth (family Pyralidae) weighing in all less than one milligram.	Fined £5 and £8 costs.
C.1746	Rubbing Ointment	Complaint	Camphor 2.8 per cent w/w. Methyl Salicylate 2.8 per cent v/w. The above constituents are in excess of the declared amounts of 2.3 per cent for each of the active ingredients. Both ingredients are volatile and they may have been packed in excess of the declaration to allow for loss on storage.	Packer and complainant informed.
C.1747	Laxative (Liver Salts)	Complaint	Contained 200 parts per million of petroleum hydrocarbons of the nature of a light fuel oil, equivalent to 45 milligrams in the whole tin.	Packers and complainant informed.
C.1889	Double Cream	Informal	Labelled Double Cream. From 1st March, 1972, should also have borne the word "UNTREATED" (Cream Regulations, 1970, Regulation 4 (21)).	Vendor communicated with.
C.1893	Gravy Mix	Complaint	Contained broken glass weighing in all 3.449 grams (one eighth of an ounce).	Fined £30 and £15 costs.
N.5242	Lamb Liver	Informal	Copper content 60 parts per million. Copper in excess of about 50 parts per million is excessive and probably originates from other than natural sources.	See sample No. N.5409

Table 24—continued.

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5244	Slimmers Coffee Drink	Informal	The label is calculated to indicate indirectly that the food is an aid to slimming and should therefore comply with the requirements of Section 24 of the Labelling of Food Regulations by stating that the food <i>cannot aid slimming</i> except as part of a calorie controlled diet.	Manufacturer notified concerning modification of labels at next printing.
C.1749	Liquorice sweet	Complaint	Contained a fragment of broken steel weighing 0.013 gram and apparently gouged from a larger object. The fragment was embedded in the liquorice confection.	Importers cautioned and complainant informed.
S.9621	Tomato Juice, Canned	Informal	Howard Mould Count – 45 per cent of fields examined contained mould filaments. Should not contain more mould than would show in 25 per cent of the fields examined.	Importer advised to acquaint supplier of requirements for tomato juice.
E.331	Dried Milk Powder	Complaint	Contained 12 milligrams of milk powder particles which were stained with 0.4 per cent of iron.	Manufacturer and complainant informed.
S.9206	Part of Chocolate Wafer Biscuit	Complaint	Contained two flat fragments of unrisen hard cooked biscuit dough (88 per cent gelatinised starch, 8 per cent protein).	Manufacturer informed and complainant notified.
N.5268	Ice Pops	Complaint	Contained a growth of a mould of penicillium type. The amounts (moist weight) were of the order of one milligram and 0.2 milligram.	} Manufacturer cautioned and complainant informed.
N.5269	Ice Pops	Informal	Contained a growth of a mould of penicillium type. The amounts (moist weight) were of the order of one milligram and 0.2 milligram.	

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9637	Savoury Turnover	Complaint	Contained part of a green-bottle fly (comprising abdomen, a small part of the thorax and three legs) weighing 5 milligrams and another part leg of very little weight.	Vendor cautioned and complainant informed.
S.9638	Ice Lollies	Informal	Unsatisfactory label. (1) No name and address of vendor. (2) The ingredient indicated by the word "essence" is not sufficiently specific. From 1st January, 1973, an appropriate designation i.e. "Ice Lolly" will also be required.	Manufacturer communicated with.
S.9643	Ice Lollies	Informal	Unsatisfactory label. See also Sample S.9638.	Manufacturer communicated with.
S.9659	Flavoured Crisps	Complaint	The opened packet contained a clean lacquered steel hairgrip weighing two thirds of a gram.	See also sample No. S.9660.
S.9660	Flavoured Crisps	Complaint	The opened packet contained a used hairgrip weighing 0.6 gram together with two dark brown human cranial hairs of 12 and 11.2 centimetres length, singed at one end and cut at the other (i.e. they had not fallen from the scalp or been pulled out).	Manufacturer cautioned and complainant informed.
S.9661	Orangeade	Informal	Contained a deposit of planktonic algae.	Matter referred to local authority concerned. New equipment being installed by manufacturer. Same manufacturer as Samples No's. S.9599 to S.9604 inclusive.
S.9662	Lemonade	Informal	Contained a deposit of planktonic algae.	

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.372	Pork Sausages	Informal	Lean Meat 28.5% Fat 36.5% <hr/> Total Meat 65.0% Pork Sausage should contain not less than 32.5 per cent lean meat.	Vendor cautioned Taking steps to prevent a recurrence.
E.382	Vegetable Pie	Complaint	Contained half a fly (head, thorax and wings, with four legs) of species <i>Musca domestica</i> (common house-fly) pressed into a piece of potato. The said fly had been heated.	Vendor cautioned and complainant informed.
C.2149	Part of Sandwich Cake	Complaint	Contained a cooked <i>Ptinus tectus</i> beetle weighing 2 milligrams.	Baker cautioned and complainant informed.
C.2150	Part of Meat Pie	Complaint	Contained a fly (<i>Musca domestica</i>).	Fined £50 and £15 costs.
E.390	Pears, Canned	Complaint	The wasp submitted with the sample had not been cooked and must therefore have fallen into the syrup after the can had been opened.	Complainant informed.
C.1750	Muffin	Complaint	Contained a dead <i>Ichneumon</i> fly weighing six milligrams and measuring a quarter inch (six millimetres in length).	Fined £5 and £3 costs.
N.5309	Toffee Lollipop	Complaint	Contained a vegetable bristle resembling Coir fibre measuring 20.5 centimetres by approximately 0.65 millimetres and weighing 8 milligrams.	Manufacturer cautioned and complainant informed.
C.2167	Cheese	Informal	Surface of cheese affected by 13 colonies of a penicillium species mould, each colony measuring approximately 8 millimetres x 7 millimetres.	Chief Public Health Inspector of area concerned notified.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5329	Hot Toast Savouries with Chicken (canned)	Informal	Chicken content 27 per cent. Should be labelled "Requires Grilling" (see Fish and Meat Spreadable Products Regulations, 1968, Section 6).	Same manufacturer as No. S.7652, 7th May, 1971.
N.5333	Cooking Chocolate	Informal	Labelled only Scotchoc. As from 1st January, 1973, will need to bear an Appropriate Designation which is sufficiently specific to indicate to an intending purchaser the true nature of the food – From E.E.C. Directive on Sugar Confectionery the appropriate designation would appear to be "Imitation Chocolate".	Manufacturer introducing new labels.
C.2067	Ice Lolly	Informal	Misprint in list of ingredients (Alginate designated Alginade).	Manufacturer communicated with.
C.2068	Ice Lolly	Informal	(1) No name and address of manufacturer (2) The ingredient "Flavouring essence" broken up to read "Flavouring, Essence" in list of ingredients.	Manufacturer communicated with.
S.9714	Shrimps in Brine, Canned	Informal	Formaldehyde content 8.5 parts per million. Probably of natural origin.	Importer informed.
S.9716	Baked Beans with Pork Sausage, Canned	Informal	Meat content of the pork sausages not greater than 60 per cent. Should be not less than 65 per cent.	Manufacturer communicated with.
C.2180	Butter	Informal	Net weight of contents 15.6 ozs. compared with declared 1 lb.	Weights and Measures Department informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.2181	Cyprus Sherry	Complaint	The opened bottle contained a very small quantity of fresh mucilaginous material including abundant epithelial cells, membranous tissue, white blood cells and particles of food – possibly a small fragment of vomit, presumably in the wine by virtue of its having been drunk direct from the bottle. Otherwise satisfactory, i.e. no ingredient present which might have induced vomiting.	Complainant informed.
N.5359	Dressed Crab	Informal	Contained a fragment of crab shell weighing 0.088 gram.	No action advised.
N.5375	Table Creams	Informal	From 1st January, 1973, will need to bear the name "Table Jelly Compound" as well as the name Table Creams.	Manufacturer communicated with.
C.2096	Low Calorie Soup, Dry	Informal	Label calculated to indicate that the food is an aid to slimming without a statement that it can only be effective as part of a diet in which the total intake of calories is controlled (Labelling of Food Regulations, 1970, Regulation 24(1)(b) (i)(ac).	Manufacturer communicated with.
S.9207	Pink Salmon (canned)	Complaint	Contained two crystals of Struvite (Magnesium Ammonium Orthophosphate) weighing 173 milligrams and 22 milligrams respectively. Struvite crystals occur naturally in canned salmon.	Complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9763	Stewing Steak (cooked)	Complaint	The 3½ ounce selection of cooked steak submitted to the laboratory from the one pound of stewing steak about which the complaint has been made contained 59 per cent of "gristle". Even assuming that the remainder of the one pound purchase was acceptable meat, this would make the gristle content of the purchase unacceptably high – in the region of 15 per cent.	Vendor cautioned and complainant informed.
N.5399	Sliced Loaf	Complaint	Contained one bisected cooked bluebottle (<i>Calliphora erythrocephala</i>) weighing 34 milligrams.	Bakery cautioned and complainant informed.
N.5409	Fresh Lamb Liver (Further to N.5242)	Informal	Copper content 130 parts per million (i.e. approximately twice that of Sample No. N.5242).	Vendor, Wholesaler and Secretary of Trade Delegation at Australian Embassy informed.
E.495	Pickle	Complaint	Contained a piece of coarse woody paper measuring about 1½ inch x 1½ inch and weighing 0.16 gram. Such paper is sometimes seen as domestic towelling and sometimes as part of multi-wall paper sacks.	Manufacturer cautioned and complainant informed.
S.9778	Steak Pie	Complaint	Contained a single piece of white hog bristle measuring 52 millimetres in length and weighing half a milligram.	Manufacturer cautioned and complainant informed.
C.2313	Table Dessert Mix	Informal	Designation of the food may not be sufficiently specific to comply with the labelling regulations which will operate from January, 1973. Should either bear an additional name "Table Jelly Compound" or firm may have to show that the present name has been in continuous use over a period of 30 years.	Manufacturer communicated with.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.2315	Apricots (Glax)	Informal	Contained 395 parts per million of sulphite preservative (expressed as sulphur dioxide) – i.e. 295 parts per million in excess of the maximum quantity of sulphur dioxide permitted in Glax Fruit by Schedule 1 to the Preservatives in Food Regulations, 1962.	Remainder of stock withdrawn.
C.2322	Borax, B.P.	Informal	Borax 106 per cent. (B.P. limits 99 – 103 per cent).	Packer informed.
N.5433	Slimming Tablets for Men	Informal	Label implied that the food is an aid to slimming but did not state that it should form part of a calorie controlled diet (See Labelling of Food Regulations, 1970, Regulation 24).	Manufacturer communicated with.
N.5434	Slimming Tablets Pack	Informal	Probably old stock: (1) The saccharin tablets had turned to powder. (2) The content of ascorbic acid was only 12 milligrams per tablet compared with 20 milligrams declared. (3) The labelling did not include a statement like that required by Regulation 24 (1)(b)(i)(ac) of the Labelling of Food Regulations, 1970.	Remainder of stock withdrawn from sale.
N.5450	Chocolate Drink	Informal	(1) List of ingredients not in descending order of weights used, i.e. Sugar present in greater quantity than chocolate or vanilla. (2) Name of the food "Skimmed milk chocolate drink" incomplete and inconspicuous.	Manufacturer notified. Same manufacturer as Sample No. C.1830

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5452	Pork Luncheon Meat (canned)	Complaint	Contained approximately $1\frac{3}{8}$ gram of dark grey coloured meat (from near the seam) stained by lead sulphide and containing 340 parts per million of lead. Also contained similar amounts of iron, zinc and tin. Lead content of whole sample only 2 parts per million.	Manufacturer cautioned and complainant informed.
C.2334	Part Loaf of Bread	Complaint	Contained an unsightly inclusion of brown bread-crumbs distributed within an area of approximately $3 \times 3\frac{1}{2}$ inches and weighing approximately six grams.	Bakery cautioned and complainant informed.
S.9786	Minced Beef, Uncooked	Complaint	Contained 800 parts per million of sulphite preservative and consisted of mixed meats. Contained fats of beef, pork and mutton.	No legal proceedings due to unreliability of information received concerning circumstances.
S.9787	Minced Beef, Cooked	Complaint		
S.9790	Baby Food (Orange and Rice Dessert) (canned)	Complaint	Can perforated with a 4 mm. cut and contents of can mouldy (all surfaces supporting a strong growth of penicillium type mould).	Vendor cautioned and complainant informed.
E.504	Tapioca	Complaint	Consisted of tapioca mixed with sago – also contained one piece of mouse excrement weighing 2.5 milligrams. The jar contained two rodent excrement droppings together weighing 30 milligrams.	Matter referred to Local Authority concerned.
C.2341	Sultanas	Complaint	Contained 3.12 grams of a paste of sultana pulp including a small amount of sand (0.1 per cent).	Packer communicated with and complainant informed.
E.524	Fish Fingers, Frozen	Informal	Fish content 54.0 per cent Poor in fish content.	No action advised.
E.533	Peas, Canned	Complaint	Contained two pieces of frayed jute string together weighing 0.12 gram.	Manufacturer cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.541	Skim Milk Powder	Complaint	Contained 12 milligrams of carbonised milk powder particles.	School Meals Supervisor and Manufacturer informed.
E.542	Skim Milk Powder	Complaint	Contained 2 milligrams of carbonised milk powder particles.	School Meals Supervisor and Manufacturer informed.
S.9818	Savoury	Complaint	Contained two fragments of broken glass weighing 60 milligrams and 77 milligrams respectively and a dead insect larva (without head) of <i>Dermestes lardaris</i> (Bacon beetle) weighing 37 milligrams.	Manufacturer cautioned and complainant informed.
E.543	Tea Cakes	Complaint	Contained a piece of Polypropylene "thread" measuring 93 millimetres (approximately 3 $\frac{3}{4}$ inches) in length.	Bakery cautioned and complainant informed.
S.9819	Bread	Complaint	Contained part of a wasp (comprising head, thorax, part of the abdomen, four legs and parts of all four wings, weighing in all 28 milligrams.	Bakery cautioned and complainant informed.
N.5489	Biscuits	Complaint	Contained 2 milligrams weight of flax fibres baked into the bottom of the broken biscuit – the other biscuits were free from foreign matter.	Manufacturer cautioned and complainant informed.
2/72 Fleet-wood Borough	Bread	Complaint	Affected by patches of the mould <i>Rhizopus nigricans</i> growth totalling approximately 7 square inches.	Bakery cautioned and complainant informed.
6 Preston R.D.C.	Danish Bread	Complaint	The crusty surfaces of the bread were affected by mould of a penicillium type covering an area amounting to 0.4 per cent of the exposed crust surfaces.	Bakery cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
1/72 Thorn-ton-Cleve-leys U.D.C.	Peas, Canned	Complaint	Contents of can had a strong sickly odour and the liquor had a well developed flora of bacteria. No imperfections in the can were observed so the bacterial condition must have been due to faulty processing.	Packer cautioned and complainant informed.
S.12	Ginger Ale	Complaint	Contained fungal mycelium and spores.	} Manufacturer cautioned and complainant informed.
S.13	Ginger Ale and Bacardi Rum	Complaint	Contained fungal mycelium and spores	
S.14	Part Steak Pudding Pudding	Complaint	Contained 8 bovine hairs (weighing 1 milligram) and a piece of hide (weighing 45 milligrams). The hair appeared to be bovine head hair.	Manufacturer cautioned and complainant informed.
S.15	Crunchy Potato and Corn Sticks	Complaint	Contained 1.6 grams of a paste consisting of finely divided "Chipsticks" material mixed with about half a gram of mineral oil and cotton fibre.	Manufacturer cautioned and complainant informed.
C.2494	Cooked, Pressed Shoulder, canned	Informal	(1) Meat content only 83% and contained added phosphates (expressed as Disodium Hydrogen Phosphate) 0.61%. (2) No indication on label that product was pork.	Poor in meat content.
C.2499	Ice Lolly Mix	Informal	Contained no fruit juice yet labelled "Boy I'm Juicy" (also the word saccharin wrongly spelled in list of ingredients.	} Manufacturer advised to have labels modified at next printing.
C.2500	Ice Lolly Mix	Informal	Contained no fruit juice yet labelled "Boy I'm Juicy".	

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.566	Pork Sausages	Informal	Meat content 63.0%. Contained 150 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration. Pork Sausage should contain not less than 65.0% total meat.	Vendor interviewed and cautioned.
S.25	Rum Flavour Truffles	Complaint	Of the twelve squares of sweetmeat, four were very lightly affected by insect webbing and excrement. The total weight of webbing with the five pellets of excrement was less than half a milligram and represented a very brief visitation by an insect.	Manufacturer and complainant informed.
E.578	Rice Pudding Canned	Complaint	Reason for charred flavour not identified.	Manufacturer and complainant informed.
N.9209	Grapefruit Juice, Canned	Informal	Minor mineral constituents appropriate only to a grapefruit drink (containing approximately 7% of juice).	See sample No. S.9219.
N.5526	Wine Vinegar	Informal	Contained 0.05 ccs. of bacterial sediment in the 13 fl. oz. of vinegar.	Packers informed.
N.5530	Crispbread	Informal	Acid value of extracted fat 27.2 but no rancid taste detected.	No action advised.
E.590	Soup Mixture	Informal	Label did not comply with the labelling requirements of Schedule 5 of the Labelling of Food Regulations, 1970 in that the full "Appropriate Designation", i.e. Oxtail Soup Mix did not appear on the label.	Manufacturer communicated with.
C.2379	Marzipan	Informal	Slightly deficient in almond oil.	No action advised.
N.5540	Doughnut	Complaint	Contained the head of an uncooked wasp (weight 22 mgms.). The body had probably been broken off while the wasp had been feeding on the jam in the finished doughnut.	Supplier taking steps to prevent a recurrence and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.9824	Sauce Mix	Informal	Contained no beef yet designations imply "Beef Stroganoff Sauce Mix", "Beef Stroganoff" or "Minced Meat Stroganoff". Designation should comply with requirements of para. 5 of Schedule 5 to the Labelling of Food Regulations, 1970, together with Regulation 3 of the same regulations, in that the designation should be specific and conspicuous.	Manufacturer communicated with.
E.597	Steak and Kidney Pudding, canned	Complaint	The foreign object consisted of calcium phosphate and resembled a phosphatic renal calculus weighing 1.87 grams — phosphatic renal calculi are usually associated with unsatisfactory kidney conditions.	Manufacturer cautioned and complainant informed.
S.9211	Barm Cake Sandwich	Complaint	Contained a dead slug (<i>Arion</i> Sp.) weighing 24 milligrams.	Fined £20 and £13 costs.
C.2387	Minced Beef (fresh)	Informal	Contained minced pork and minced mutton as well as beef.	Meat Manager of store interviewed.
E.651	Desiccated Coconut	Complaint	Contained 59 pieces of rodent excrement, altogether weighing 0.167 gram, and a tuft of rodent hairs (maximum length 6 millimetres) partially attached to a piece of skin epithelium and weighing approximately half a milligram.	Manufacturer notified. Insufficient evidence to take legal proceedings.
C.2570	Choc Ice	Informal	Present draft EEC Directive seems to discourage the use of the term "choc" for confectionery made from fats other than cocoa butter.	Manufacturer communicated with.
S.9218	Meat Pie, part of	Complaint	Contained a piece of close grained paper of the kind referred to as "grease proof" stained with carbon and weighing 0.37 gram.	Manufacturer cautioned and taking steps to prevent a recurrence and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.652	Bread	Complaint	Contained 0·100 gram of dark coloured dextrinised starch – possibly from a baking tin.	Bakery notified and complainant informed.
C.2597	Chicken and Mushroom Savoury, canned	Informal	Commodity named in a manner which brings it into the category required by Regulation 6(7) of the Canned Meat Product Regulations 1967 to contain not less than 35% of meat.	Manufacturer now using amended labels.
S.9839	Bread	Complaint	Contained one worker wasp measuring 11 millimetres in length and weighing 50 milligrams.	Fined £25 and £28·50 costs.
C.2620	Brown Wholemeal Loaf	Complaint	Contained the greater part of a moth measuring 9 millimetres in length and weighing 8 milligrams.	Fined £50 and £18 costs.
C.2576	Part Slice of Brown Bread	Complaint	Contained a piece of eight-stranded cotton string measuring 17 cms. in length and weighing 0·165 gram, together with 0·563 gram adhering baked bread-crumbs.	Fined £20 and £10·50 costs.
E.654	Treacle Toffee	Complaint	Contained a piece of iron wire measuring 69 mm. in length and weighing 91 mgms. It had a thickness of about half a mm. (standard wire gauge 26).	Manufacturer cautioned.
S.58	Baked Beans in Tomato Sauce	Complaint	Contained a matt of fungal mycelium (belonging to the class Ascomycetes) which had covered the entire surface (7·3 centimetres diameter) but had shrunk and wrinkled – Thickness approximately 0·3 mm. Blotted weight 3½ gram. A slot measuring about 2½ mm. long perforating the cans was found very close to the lipped base of the can and had probably been made with a carton opening knife.	Vendor cautioned concerning carton opening procedures and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5570	Chicken Supreme, canned	Informal	Old stock (can marked with a 6d token against a second purchase) and labelled only "CHICKEN SUPREME". Meat content only 43%. Should be 60% and bear a designation "Chicken in Sauce".	Manufacturer notified and vendor advised to withdraw remainder of stock.
S.9219	Grapefruit Juice	Formal	Consisted of a grapefruit drink containing only 7% of juice.	Further sample to No. S.9209. Fined £25 and £13 costs.
E.655	Baby Talcum Powder (medicated)	Complaint	The powder was free from declared hexachlorophene medicament.	Packers have since deleted reference to hexachlorophene. Complainant informed.
E.608	Low Calorie Sugar	Informal	Labelled sugar with low calorie artificial sweetener without complying with the provisions of the Regulation 24 of the Labelling of Food Regulations, 1970.	Manufacturer communicated with. Same manufacturer as samples Nos. E.47 and S.9576.
E.613	Tomato Sauce, canned.	Informal	Howard Mould Count: 53% of fields showed presence of mould.	No action advised.
S.40	Smoked Haddock and Cheese Toast Topper (canned)	Informal	Label did not bear the words "Requires Grilling" as required by Regulation 6 of the Fish and Meat (Spreadable Products) Regulations.	Manufacturer to amend labels at next reprint.
S.28	Baked Beans in Tomato Sauce (canned)	Complaint	Contained a small piece of clean knitted cotton cloth having a green dyed cotton edging and including black and white yarn. It was very tangled and measured 36 x 3 millimetres and weighed 14 milligrams.	Manufacturer cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.102	Glucose and Vegetable Fat Powder	Informal	The "appropriate designation" "Non dairy Creamer" which attempts to meet the requirements of Regulation 3 of the 1970 Labelling Regulations is hardly sufficiently specific to indicate the true nature of the food.	Manufacturer communicated with. Redesigning label.
N.5626	Crumpets	Complaint	Contained a fragment of cooked crumpet mix weighing a quarter of a gram and soiled (mainly on the outer surfaces) with half a milligram of rusty iron.	Bakery cautioned and complainant informed.
N.5635	Pork Sausages	Informal	Meat content only 46%. Should be not less than 65%.	See sample No. N.5786.
C.2403	Cinnamon Sugar	Informal	Contained the spice Cassia bark (as indicated in the list of ingredients) and not cinnamon yet designated "Cinnamon Sugar".	Manufacturer communicated with.
S.176	Chocolate Drink	Informal	(1) List of ingredients not in descending order of weights used, i.e. Sugar present in greater quantity than chocolate or vanilla. (2) Name of the food "Skimmed Milk Chocolate Drink" incomplete and inconspicuous.	Manufacturer communicated with. Same manufacturer as sample Nos. C.1830 and N.5450.
E.719	Mineral Water	Complaint	Contained broken glass amounting to 0.469 gram. Another bottle labeled M.416 contained 0.975 gram of broken glass, making a total of 1.444 grams of broken glass in all.	Fined £75 and £13.30 costs.
S.160	Bread	Complaint	Contained approximately half a gram of black coloured wheat starch which rendered all thirteen of the slices submitted unsightly. The discoloured material was mainly stained with carbon but about 2 milligrams of iron oxide and seven milligrams of mineral grease were also present.	Bakery cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5662	Antiseptic Ointment	Informal	Contained hexachlorophene 0.05% by weight as indicated in list of ingredients but directions on base of tin recommends it for nappy rash, and carton stated "for all the family".	Manufacturer communicated with. New labels now in use.
N.5677	Diet Ice	Informal	The words Ice Cream prominent on label as part of address. Fat content only 1.7% and contained saccharin 0.014% — The provisions of Regulation 5 of the Ice-Cream Regulations, 1967, apply, and the label of the product should not have led an intending purchaser to believe that he was purchasing ice-cream. The provisions of Schedule 5 of the Labelling of Food Regulations, 1970, should have been strictly adhered to.	Manufacturer communicated with. New form of label to be introduced.
E.708	Low Calorie Jam	Informal	No specific indication on label that the food could only aid in slimming when forming part of a calorie controlled diet.	Manufacturer communicated with. New labels to be used in future.
C.2427	Part tin Milk Rice Pudding	Complaint	The peculiar odour of the liquid from the can was due to a strong bacterial flora. The can was damaged by a small horizontal slit 2 mm. long.	Vendor cautioned re carton opening procedures and complainant informed.
C.2432	Coffee and Chicory Essence, Sweetened	Informal	Caffeine content only 0.2% v/v. When Coffee and Chicory Extract contains less than 0.25% Caffeine the manufacturer must be prepared to show that he has used not less than 2 lbs. of roasted coffee for every gallon of extract.	Manufacturer communicated with.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.754	Tomatoes, canned	Complaint	The opened can of food had begun to ferment, so the significance of the tin content (650 parts per million compared with recommended limit 250 parts per million) uncertain. An area of the tin plate of the can near the seam, however, was in very poor condition and probably was the basis of the complaint. Lead content of the food 480 ppm., Zinc content of the food (possibly from a dried flux) 850 ppm.	Importer cautioned. Further sample genuine.
S.9220	Butter Munch (flour confectionery)	Informal	Contained 32% of fat of which only 9½ (about a third) was butter fat, yet labelled "Butter Munch". Draft EEC Directive recommends that all the fat in a cake labelled "Butter X" should be butterfat.	Manufacturer agreed to amend labels
S.9221	Jam and Cream Cake	Informal	Labelled "Jam and Cream" yet Fat content of "cream" filling 31% of which not more than one thirtieth was butterfat. (Butterfat content of sponge - Nil).	Vendor cautioned.
N.5707	Sugar Cake Decoration	Informal	Contained the colouring matter Blue VRS which was withdrawn as a food colour in 1966.	Manufacturer and vendor communicated with. Remainder of stock withdrawn from sale.
S.228	Cake	Complaint	Contained a dead moth <i>Ephestia Kuhnella</i> (Mediterranean flour moth) measuring 8 millimetres in length and weighing 6 milligrams.	Complainant unwilling to give evidence.
C.2757	Part bottle Dandelion and Burdock drink	Complaint	Contained fragments of broken glass, weighing in all 1.42 grams.	Fined £50 and £23 costs.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.229	Pineapple Chunks (canned)	Complaint	Contained a small beetle of the family nitidulae (which includes a large number of sap-feeders) but it was not a British species and could not be further identified. It had been cooked and probably was originally associated with the fruit.	Importer and complainant informed.
C.2852	Finger Rolls	Complaint	Contained two pieces of cotton yarn and four cotton threads weighing in all 85 milligrams.	Fined £20 and £10·50 costs.
N.5736	Lettuce	Informal	Thiacarbamates content (expressed as Thiram) 36 parts per million. Recommended limit 0·3 part per million.	Inspector unable to trace source of supply.
E.655	Cheese Slices	Complaint	The foreign object submitted with the 1½ slices of cheese was a very damaged pellet of steel which appeared to have been derived from a nut which had been through a mixing machine.	Manufacturers cautioned. Complainant informed.
E.656	Soft Drink	Complaint	Contained fragments of broken glass weighing in all 1·335 grams.	Fined £50 and £18 costs.
S.9223	Cornish Pasties	Complaint	The pasties contained 12 per cent of cheese but no meat. The filling also contained onion and potato.	Manufacturer cautioned.
S.253	Minestrone Soup Powder	Informal	In addition to the name "Soup Minestrone" the label should bear a specific appropriate designation (i.e. Minestrone Soup Mix) which complies with the requirements of Schedule 5 of the Labelling of Food Regulations with regard to conspicuous display.	Packer advised to redesign label before 1st January, 1973.
S.259	Baked Beans and Pork Sausage, canned	Informal	Meat content of the pork sausages only 54·5% (meat content of can 12%) – may be old stock – labelled Chef. Regd. 7½ oz.	Manufacturer taking steps to prevent a recurrence.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.768	Soup, canned	Complaint	Contained parts of a spider (prosoma and 3 legs) weighing 0.031 gram.	Manufacturer cautioned and complainant informed.
E.781	Mussels in Vinegar (jar)	Informal	Cadmium 0.7 part per million.	No action advised.
S.269	Christmas Novelty with Sweets	Complaint	Contained a living cockroach nymph and four pellets of insect excrement but the side seam of the containing bag was open and there was an insect hole in the cellophane — furthermore the sweets were too dry to support cockroaches.	Storage arrangements investigated and complainant informed.
E.657	Finger Rolls	Complaint	Contained a common housefly (<i>Musca domestica</i>), entire except for the head, measuring 5 millimetres long and weighing 6 milligrams.	Fined £20 and £18 costs.
S.9224	Peas, Canned	Complaint	The lesser housefly found in the food had not been cooked.	Manufacturer and complainant informed.
C.2889	Ginger Marmalade	Complaint	Contained the hind leg of a bee.	Manufacturer taking steps to prevent a recurrence and complainant informed.
S.294	Whole Mushrooms, bottled	Informal	(1) Consisted of mushrooms in salted water yet labelled only WHOLE MUSHROOMS. (2) After 1 January 1973 will need to add a list of ingredients on label.	Manufacturer communicated with.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.824	Cooked Meal	Complaint	The cooked fly submitted with the sample was very damaged but it was a domestic housefly (<i>Musca domestica</i>) weighing 11 milligrams. There were no means of showing with which part of the meal it had been associated (except that as it had not been fried it had not been cooked with the chips), or, as the meal is stated to have been reheated, whether it arrived prior to the cooking or prior to the reheating.	Vendor and complainant informed.
N.5778	Fresh Double Cream	Informal	Failed Methylene Blue test — labelled Fresh Double Cream and Coded K 21 U (purchased 22 November).	Manufacturer informed.
N.5786	Pork Sausages	Formal	Meat content 63.5%. Should contain not less than 65% meat.	Manufacturer cautioned.
S.9225	Lager (bottled)	Complaint	Contained two insects puparia from a fly of the family <i>Drosophila</i> together weighing 5 milligrams.	Manufacturer cautioned. Taking steps to prevent a recurrence.
C.2773	Wine Vinegar	Informal	Contained 0.3 ccs. of yeast sediment.	Packers informed.
C.2775	Part Steakette	Complaint	Contained a fragment of galvanised iron wire approximately 1/16 inch long and 1/32 inch diameter.	Supplier cautioned and complainant informed.
E.835	Brawn	Informal	Meat and Gelatine 54%. Brawn should contain not less than 60% meat.	Manufacturer interviewed and cautioned.
S.230	Orange Drink	Complaint	The spider (<i>Herpyllus blackwalli</i>) found in the sample was a common one and it had neither been heat treated nor soaked for long enough to remove catalases — there are therefore no means of deciding when it gained access to the drink.	Complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.299	Fish Cake	Complaint	Part of a cooked earwig (<i>Forficula auricularia</i>) was loose in the sample.	Manufacturer and complainant informed.
N.5787	Bread	Complaint	Contained 2.12 grams of unrisen dough stained with 886 parts per million of iron.	Bakery cautioned and complainant informed.
C.2784	Biscuits, part packet	Complaint	The five black pellets submitted with the biscuits were fresh rodent droppings weighing in all 23 milligrams. The animal had included a substantial amount of oat in its diet but no oat starch was present in the biscuits. The wrapper showed no sign of rodent damage.	Complainant interviewed re history of the occurrence.
C.2908	Almond Tart	Complaint	Both samples contained loose fresh mouse droppings, the weight associated with the almond tart being four milligrams and that associated with the jam turnover being three milligrams.	Legal proceedings taken. Case dismissed.
C.2909	Jam Turnover	Complaint		
E.658	Fish Fingers	Complaint	Contained the greater part of a fly <i>Calliphora vomitoria</i> — a fairly common blue-bottle — weighing 48 milligrams.	Fined £50 and £19.50 costs.
E.659	Cheddar Cheese	Complaint	Contained a rusty steel turning (probably from a scouring pad) 8 millimetres long and 0.5 millimetres x 0.13 millimetres. It weighed about 1 milligram.	Manufacturer cautioned and complainant informed.
E.661	Cake	Complaint	Contained a piece of polystyrene weighing 0.158 gram.	Bakery cautioned.
E.662	Acetic Acid	Complaint	Acetic acid content 24.8% by weight. Observations Acetic acid solution BP would be 32.5 to 33.5% acetic acid by weight.	Complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.866	Fresh Double Cream, pasteurised	Informal	Sample sour (acidity on the fat-free cream 0.3% lactic acid) and failed methylene blue test - Code 20K. Received 30th November.	Vendor communicated with.
E.868	Mussels in Vinegar (jar)	Informal	(1) As from 1 Jan. '73 the appropriate designation will be "Mussels in Vinegar" and the lettering of the words "In Vinegar" will need to be increased in size to a height of at least 2 millimetres in accordance with the requirements of the 5th Schedule to the Labelling of Food Regulations. (2) Mercury content of the mussels rather high (0.9 ppm.).	Packer agreed to amend labels.
S.9227	Sausage	Complaint	Contained a distorted cooked pellet of rodent excrement weighing six milligrams.	Fined £50 and £18 costs.
C.2812	Sugar with low calorie artificial sweetener	Informal	Labelled Sugar with low calorie artificial sweetener without complying with the provisions of Regulation 24 of the Labelling of Food Regulations, 1970.	Manufacturer communicated with. Same manufacturer as samples Nos. E.47, S.9576 and E.608.
S.372	Custard Pie	Complaint	Contained a turkey scale measuring 11.5 millimetres in width by 18 millimetres in length and weighing 47 milligrams.	Fined £10 and £15.50 costs.
N.5801	Pork Sausages	Informal	Contained 75 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed and cautioned.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
C.2817	Part loaf of Bread	Complaint	The sliver of glass submitted with the sample was a piece of heat resistant glass (such as Pryex) having a density of 2.274 and a shape suggestive of the inside corner of a rectangular dish such as a butter dish (no other fragments of glass were found). The sliver weighed 0.429 gram.	Bakery Manager and complainant interviewed
S.378	Baked Beans with Tomato Sauce (canned)	Complaint	Contained a cooked fly of the family Trichoceridae – common throughout the year but generally known as “Winter Gnats”.	Complainant informed. Manufacturer notified.
E.664	Mixed Grill (papier mache and cellophane pack)	Complaint	The dark coloured material on all the sausage products in the pack consisted of powdered metallic aluminium (probably derived from a tray). The amounts found were:— Sausage Meat 0.6 mgm. Black Pudding 0.1 mgm. White pudding with vine fruits 0.05 mgm. Plastic pack 0.02 mgm.	Manufacturer cautioned and complainant informed.
E.665	Cake	Complaint	Contained a printed paper label weighing 0.814 gram. It bore somewhat indistinct lettering and was reinforced on the back with an adhering open mesh cotton fabric similar to muslin.	Bakery cautioned and complainant informed.
N.5831	Ham, Canned	Complaint	The dark staining consisted of very finely divided lead sulphide – lead content of the meat in the whole can 6.6 ppm. parts of the meat. Lead in Food Regulations 1961 prohibits the sale of canned meat containing lead in excess of 5 ppm.	Inspector unable to trace the source.
S.409	Peeled plum Tomatoes (canned)	Complaint	Contained a cooked common housefly (<i>Musca domestica</i>) weighing 19 mgms.	Importer cautioned and complainant informed.

Table 24—continued

No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
N.5851	Part Sliced Loaf	Complaint	Contained a pellet of unrisen dough stained with carbonised wheat starch and half a milligram of iron.	Bakery cautioned and complainant informed.
N.5852	Two opened cans of Cherries	Complaint	First can contained eight larvae of Cherry Fruit Fly (weight 11 milligrams and second can contained twenty larvae of Cherry Fruit Fly (weight 27 milligrams).	Manufacturer cautioned. Stock withdrawn from sale.
N.5853	Red Cherries, canned	Informal	Contained three larvae of Cherry Fruit Fly weighing in all 5 milligrams.	
S.426	Corned Beef (canned)	Complaint	The species of mould growing on the surfaces of the ten day opened sample consisted mainly of <i>Penicillium</i> but they had not penetrated far into the meat. If the meat was mouldy, as alleged when the can was opened therefore, the growth cannot have been established for very long and probably had resulted from a blow which opened the weak strip intended for easy can opening. No perforation existed in the parts of the can available for laboratory examination.	Vendor and complainant informed.
E.667	Part Barm Cake	Complaint	Contained shredded tobacco and a fragment of white, fine-fibred paper resembling cigarette paper, all derived from a cigarette and weighing 0.160 gram.	Fined £50 and £18 costs.
E.668	Cheese Food	Complaint	The 0.104 gram of crystals present were not glass but had the nature of disodium hydrogen phosphate — which on further standing might have effloresced to a white powder.	Complainant informed. Manufacturer taking steps to prevent a recurrence.
E.669	Baby Food (jar)	Complaint	Contained two pieces of broken glass, one weighing 3.53 grams and the other weighing 0.012 gram.	Fined £80 and £18 costs.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.670	Sweets	Complaint	One of the sweets contained a chip (not a splinter) of hardwood weighing 0.077 gram.	Manufacturer cautioned and complainant informed.
E.671	Meat Pudding	Complaint	Contained a piece of hide with attached cow hair weighing in all 0.14 gram.	Manufacturer cautioned and complainant informed.
S.449	Fresh Chestnut Puree (canned)	Informal	The designation Fresh Chestnut Puree is not appropriate to a canned product.	Importer communicated with. Will use correct designation in future.
N.5842	Pineapple Flavour Soft Cheese	Informal	Labelled only "Fresh Pack". Should be labelled "Full fat soft cheese with pineapple".	Vendor agreed to amend labels.
N.5854	Bread, Butter and Cheese Spread Sandwich	Complaint	Contained 0.168 grams of broken glass. (No evidence of the association of the broken glass with the bread specifically.)	Vendor and complainant informed.
N.5855	Part Meat Pie	Complaint	The purple stain on the top of the filling measured 16 x 9 millimetres and it consisted of a piece of gristle affected with a triphenyl-methane dye resembling Methyl Violet — probably derived from a carcass stamp.	Vendor notified and complainant informed.
S.450	Skinless Pork Sausages	Complaint	A piece of adipose tissue weighing 0.01 gram was marked with a quantity of blue coal tar dye which was present in too small a quantity to identify.	Complainant informed.
E.948	Cheese	Informal	Consisted of full fat hard cheese but not labelled as such in accordance with the Provisions of the Cheese Regulations, 1970.	Vendor taking steps to prevent a recurrence.

Table 24—continued

No. of Sample	Description	Formal, Informal, Complaint or Private	Nature of Adulteration or Irregularity	Observations
E.957	Flour Confectionery	Complaint	The nail submitted with the part cake had a small amount of wood debris adhering to the underside of the head but it was otherwise quite clean. There was nothing to indicate whether it had been in the cake and there were no cells from a person's mouth to indicate its having been bitten. It weighed 0.89 gram.	Complainant informed.
S.456	Bread Roll	Complaint	Contained a sultana weighing 70 milligrams.	Complainant informed.
S.455	Milk and Part of a Meal	Complaint	Milk slightly low in solids-not-fat content but it had a genuine freezing point. The part meal (80% milk) contained a spider which had either been cooked or had been in a dried condition for a very long time. i.e. it seemed more likely to have been associated with the cereal than with the milk but definite association with one or the other could not be established.	Complainant informed.
E.958	Orange Drink, remains of	Complaint	Contained part of a dead leaf (weighing 20 milligrams) in 1½ ccs. of rinsings containing only one tenth (by volume) of drink.	Complainant informed.
E.958A	Orange Drink, unopened	Complaint	Contained fused silica material with minute inclusions of carbon and metallic aluminium of unknown origin weighing 0.02 gram – insoluble – and had not affected the drink.	Manufacturer cautioned and complainant informed.
E.959	Flour Confectionery	Complaint	Contained pieces of a small fly of the family Calliphoridae (probably a small bluebottle) weighing 15 milligrams.	Prosecution pending at time of writing. *£50 fine, £18.30 costs.

* late hearing

Table 24—continued

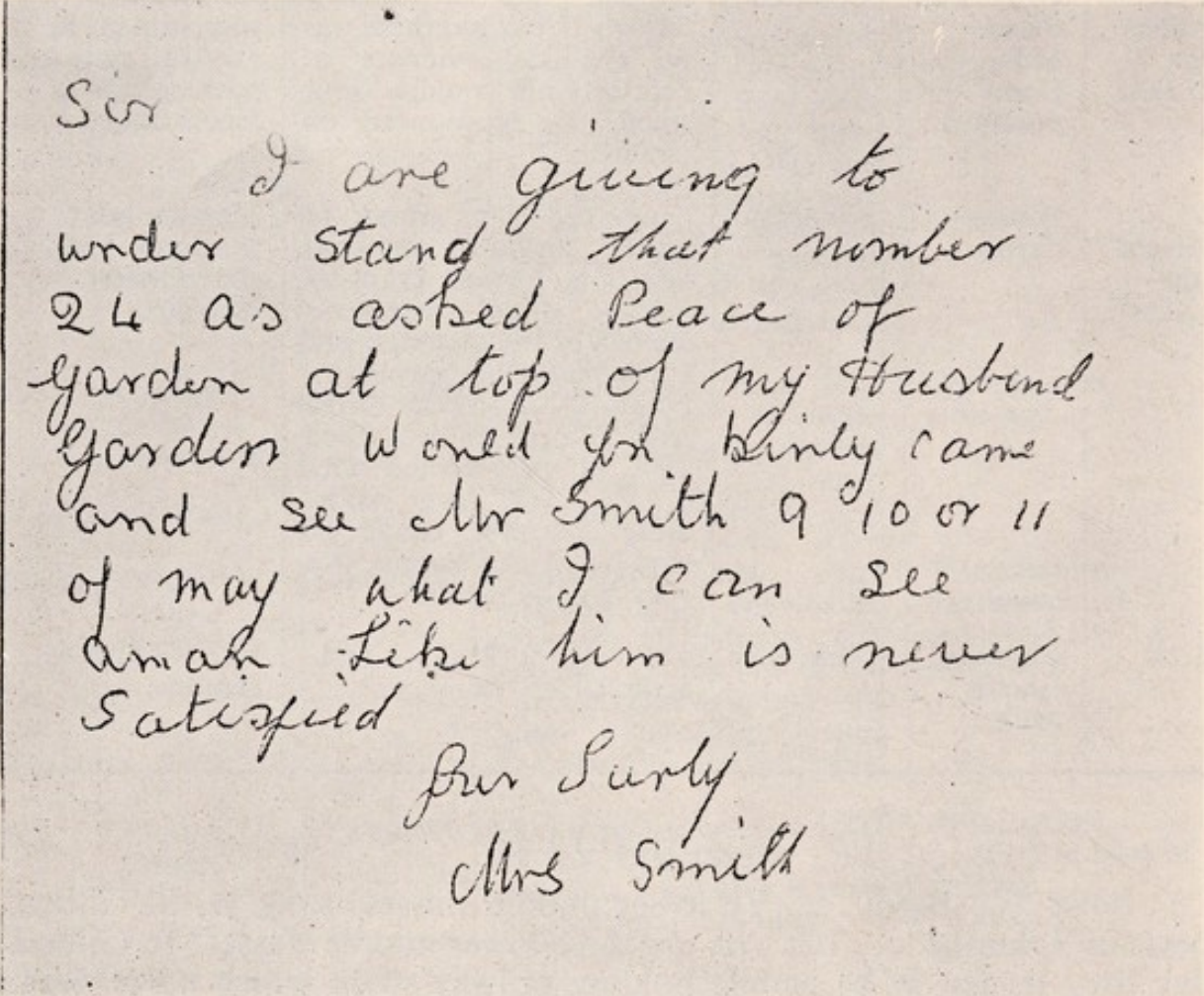
No. of Sample	Description	Formal, Informal Complaint or Private	Nature of Adulteration or Irregularity	Observations
S.457	Corned Beef (canned)	Complaint	The dark patches about which the original complaint was made were only patches of partly gelatinised gristle but the tinplate had lifted from the other end of the can, marking the surface of the meat with patches containing iron and up to 430 parts per million of tin.	Complainant informed. Manufacturer taking steps to prevent a recurrence.
S.458	Christmas Pudding	Complaint	Contained one live larva of <i>Ephestia Cautella</i> (Tropical Warehouse Moth) weighing 28 milligrams, being approximately half grown.	Manufacturer cautioned and taking steps to prevent a recurrence. Complainant informed.
2 Ather-ton U.D.C.	Dried Full Cream Milk, Compounded	Complaint	Sample had a slightly tallowy odour but there was no chemical evidence of rancidity nor could a "sour smell" be reproduced on mixing.	Advised that complainant be asked to state how powder was reconstituted.
1 Ulvers-ton U.D.C.	Potato Crisps	Complaint	Contained 1·6 grams of black unsightly material and one further gram of potato crisp fragments stained by the material. The black material consisted of potato crisp powder mixed with 27% of edible oil and 18% of salt stained with 0·1% black iron oxide. Note also, the edible oil content of the sample was very slightly rancid.	Manufacturer cautioned and complainant informed.
S.231	Channel Islands Milk	Informal	Fat content 2·85%. Deficient 28·7% fat.	Further sample genuine.

LABELLING

Bow! . . . Bow! . . . Ye lower middle classes! sang W. S. Gilbert's peers in 'Iolanthe' . . . but who *are* these lower middle classes? In Gilbert's day they tended to be people holding railway stock which never paid a dividend; but in the present time they are people rich and leisured enough to be able to encourage their children to learn to play musical instruments

which later made them rich, famous and Upper Middle class, and able to cultivate unattractive accents for exclusive use as part of the motley for their star appearances. The lower middle classes have never been "Consumers" on any great scale, because they have tended to be critical of what they buy. Their wives form Consumer pressure groups!

There is a larger section of the population, unfortunately, which has fallen victim to the mill-owner-minded propagandists, and which dutifully abandons its young to nursery schools and similar Pinocchio-style carnivals disguised to provide donkeys for the salt mines. It is unfortunate that the local authorities were the bodies required to carry out a task so comprehensive, because the local authorities already needed to live down the historical fact that it was they who first took small children from their Poor Houses, and set them to work in dark satanic mills. Women and children make a docile work force, and so important was it to have such a force in the late 1700s that mill-owners were accepting one idiot child with every group of twelve sane ones they were buying from the local authorities, so that they could get the immature and docile labour they preferred. In a radio broadcast on 11th September 1972 a spokesman for the Association of Remedial Education was saying that this same proportionality has been maintained by the output of illiterate children from modern schools, but that the proportion is being increased. Plate 3 shows a letter which was



Sir
 I are giving to
 under stand that number
 24 as asked Peace of
 garden at top of my husband
 garden would you kindly come
 and see Mr Smith 9 10 or 11
 of may what I can see
 amah like him is never
 satisfied
 Mrs Smith

addressed to a local authority in 1972 (not Lancashire) and plates 4, 5 and 6 show in the spellings of 'Analyst', 'fowl', and 'debt' that even those who instructed us in 1972 were only marginally more literate than 'your surly Mrs. Smith'.

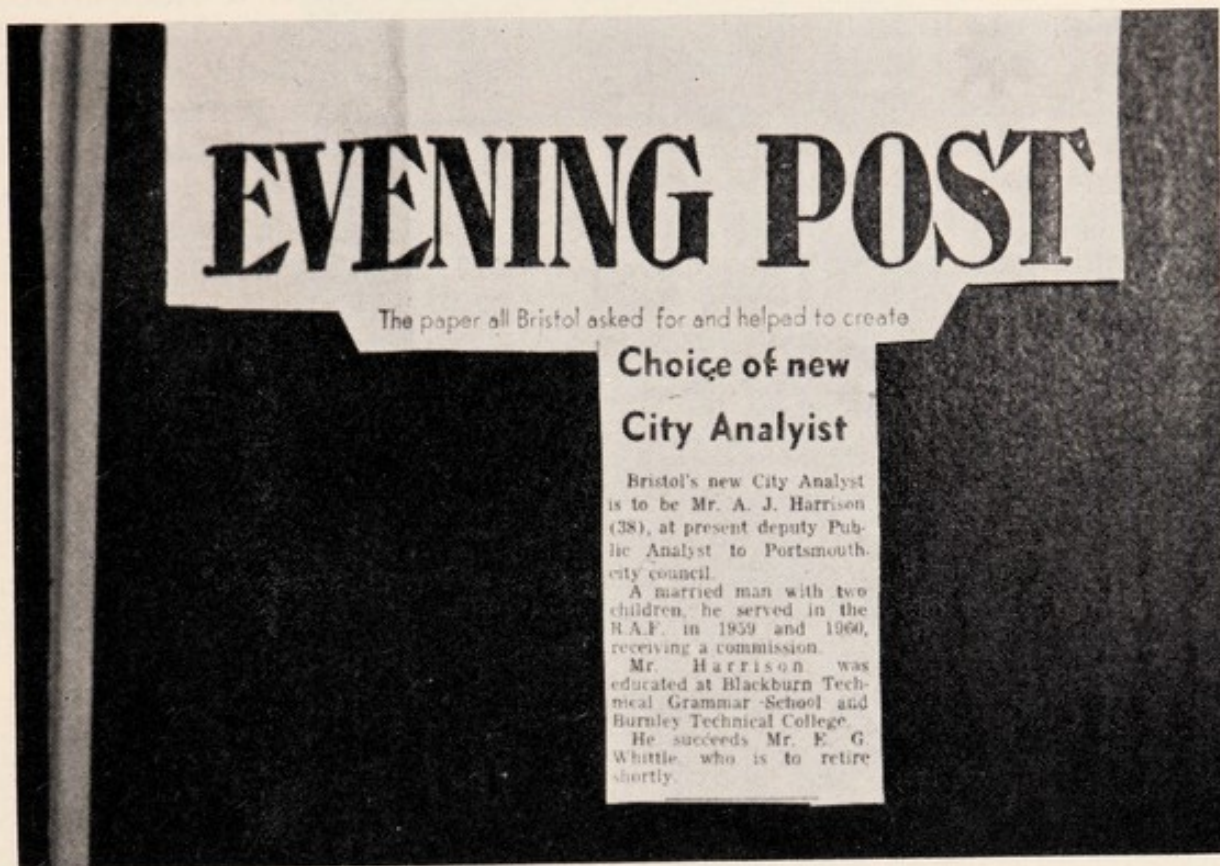


PLATE 4 Evening Post

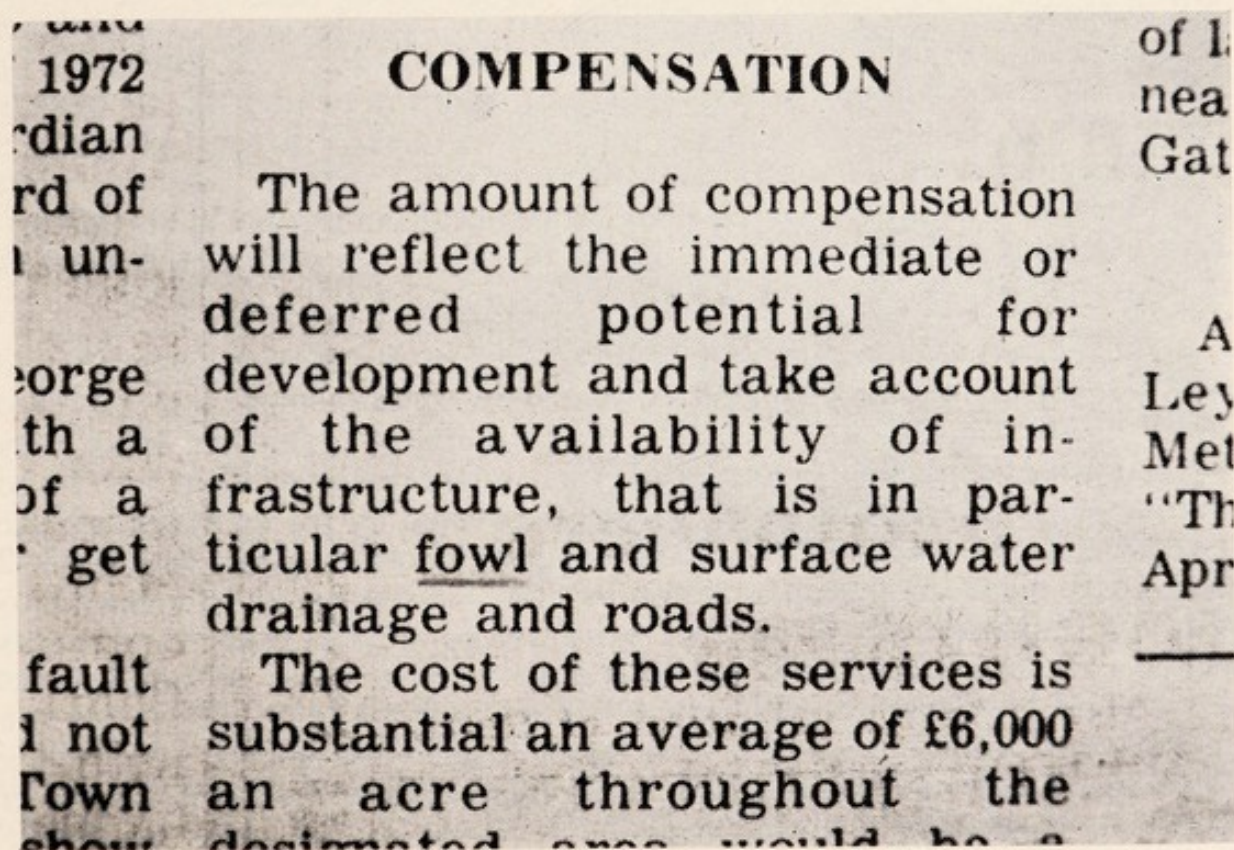


PLATE 5 "fowl"

need a friend,
could depend
dear, to me
wife Ethel, so

loving memory
and grandmo
1, 1966
mention often,
with you still
forgotten, you
will
and John

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died away April
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rth Drive and 6
horley.

e Crossdale) —
s of a dearly
ster Irace, died
passed dear
were called

member that
brother John

Deaths

E. Brindley
reston Road,
thank all
d neighbours,
t. G. Greenall
Infirmary for
sions of sym-
r sad loss of a
father and
also accorded
eral director.

Dickinson and
see their sin-
dies, friends
here of some

and beauti-
d during his
to be deco-
d and charge
d by the
will price

emergency calls on Saturday 12
midday to 12 midnight.

CHEMISTS' ROTA: E.
Blackledge Ltd., Steeley Lane
will be on duty from 6 p.m. to 7
p.m. on Sunday, April 23, and
during the rest of the week
between 6 p.m. and 7 p.m. ex-
cept Saturday.

Daughter 'squared up' to mother over dept

WHEN A mother asked
her daughter for £10 she
owed her, the daughter
"squared up" to her, a
Chorley court heard on
Tuesday.

Before the magistrates was
20-year-old Shiona Marie
Woods, of Albert Street,
Chorley, who was charged with
being drunk and disorderly
outside her mother's home in
King Street.

Woods pleaded guilty and was
fined £2.

Inspector Ian McPherson said
that Woods was in the street
being aggressive towards her
mother and a woman named
Baker. She was seen with

given a three month
sentence suspended for
years by a Chorley court
Friday after she had claimed
social security.

Mr. E. Martin, prosecuting on behalf of
Department for Social Sec-
said that she filled in a form
say she was living alone with
her three children when she
also living with her co-
law husband. The defend-
pleaded guilty.

She was ordered to pay
of £10.

BRINDLE man
Lawrenson of Walmale
Farm, was fined £15 by
magistrates on Tuesday
he pleaded guilty to
without due care and at-
Superintendent Phillip
told the court: "The de-
was driving a car to
horse box when he collided
the rear of a car tri-
south on the nearside of
Road, Whittle-le-Woods.

TWO FAIRGROUND
John Lindsay (23) and
Arthur Jackson (19), both
fixed address, were
£20 each by the
magistrates on Tues-
appear before them to-
(Friday) accused of
car tax disc.

PLATE 6 £10 dept

It was intended to be for the protection of these, the general public, that the manner of labelling foodstuffs has been subject to regulation, but in many cases the rules for labelling are so complex, and the subtleties of meaning are so nice, that it might take a Doctor of Literature to appreciate them. Certainly the nuances of meaning behind the distinction made between the words "meat" and "other meat" in the Labelling of Food Regulations 1970 were lost to mere ignorant analysts until they were explained in The Food Standards Committee Report on Offals in Meat Products (a summary of which appears on an earlier page of this report).

There were no fewer than sixty-three food or medicine labels criticised in 1972, but it may not always be clear why some of these are discussed under 'Labelling'. Questions affecting Vitamins for example, when they occur in connection with products which might be referred to as "Food Supplements", become matters which are covered by the legislation of the Labelling of Food Regulations. (The Amendment Regulations SI 1972 No. 1510 made in October simplified the legislation which related to Vitamin preparations, so that less restrictive conditions apply to products which contain vitamins and minerals than were formerly required. Thus Folic Acid and Vitamin B₁₂, which did not appear in a schedule to the regulations, would previously have been totally disallowed, as would a food name such as Potato crisps with Salt—which would have been a claim for a non-scheduled mineral).

Tonic Ambrosium (sample 3/24) was one food supplement which was found to be deficient of vitamin B₁ even though the declared content had been related to a yeast ingredient. The product was also deficient in its caffeine content compared with the amount declared on the label. Sample 2/36 was also a vitaminised food supplement, but this also bore recommendations for its use in slimming diets. At the time of examination it bore a claim about the presence of Vitamin E, which, like the vitamins mentioned above, had not been included in the schedule, and it mentioned the quantities of vitamins which *were* present only in terms which were not acceptable under the labelling regulations. Its reference to slimming, imposed an obligation to comply with Regulation 24(1)(b) (i) (ac) which requires a statement that the preparation can only aid slimming when forming part of a calorie controlled diet. In addition it needed to add a sufficiently specific "appropriate designation" which conveyed a knowledge of the true nature of the food. Subsequent correspondence revealed that the firm had already made alterations to their labels, although these did not cover all the matters which had been raised. Plate 7 illustrates a proof of the new label which was said to have been introduced, from which it may be seen that the education problem had arisen once again, this time in connection with labelling. The firm itself seemed to be having trouble over the spelling of "Lecithin".

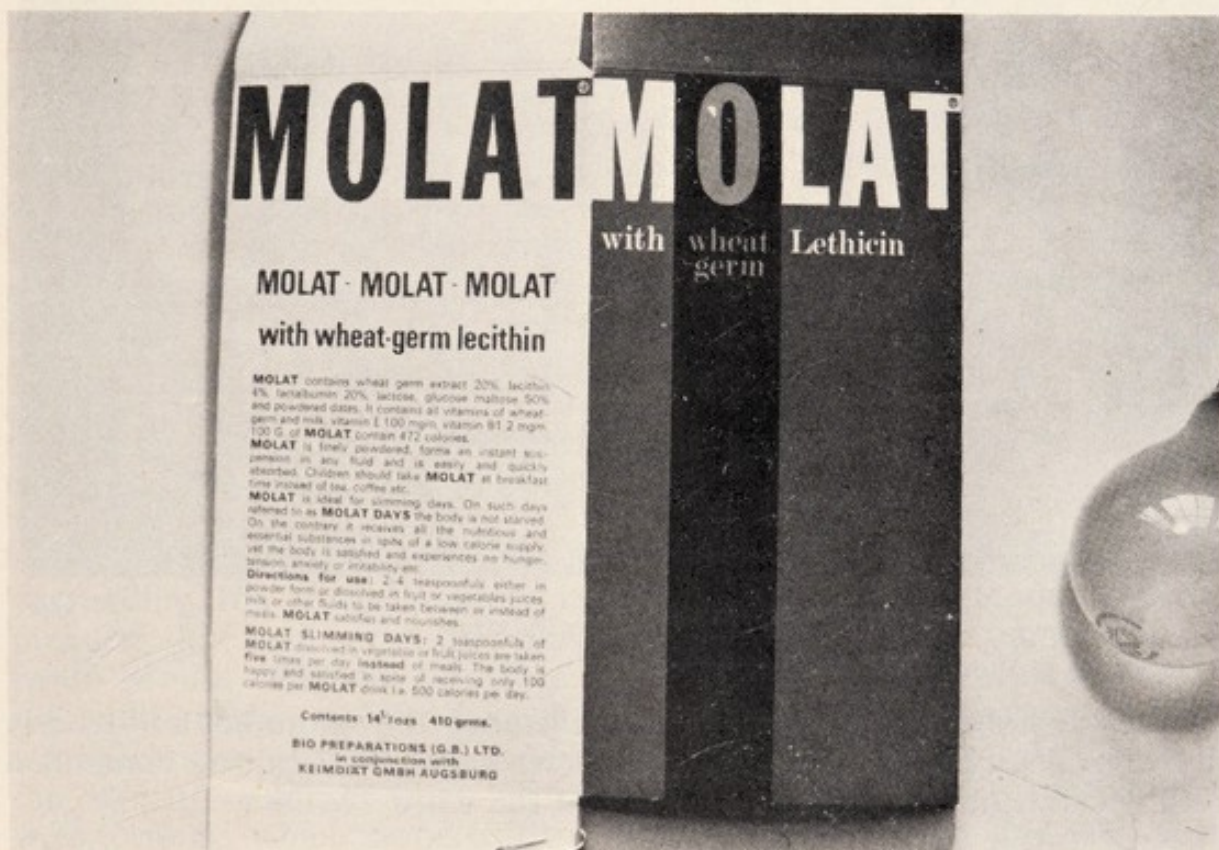


PLATE 7 Molat

The vitamin food supplement firms and the slimming food firms have a right to be feeling harassed. A Report of the Sub-committee on Metrication of the British National Committee for Nutritional Sciences has taken note of the EEC draft Directive on harmonisation of legislation relating

to measuring units, and has recommended that SI units should be adopted. This will mean that International Units and Calories will soon go, giving place to micrograms and kilojoules.

Fifteen labels in all were criticised in 1972 with reference to vitamin or slimming claims. In two further instances packages of growing salad foods, samples N4854 and 345 made reference to the presence of vitamins without stating which vitamins were involved and how much vitamin was present. Sample S9135 was, in addition to making a slimming claim, wrongly designated as 'Buttermilk', when in reality it was a made-up product based on skimmed milk, and cultured in much the same manner as is done with Yoghourt.

Plate 8 shows how the brand name of one product had been adjusted

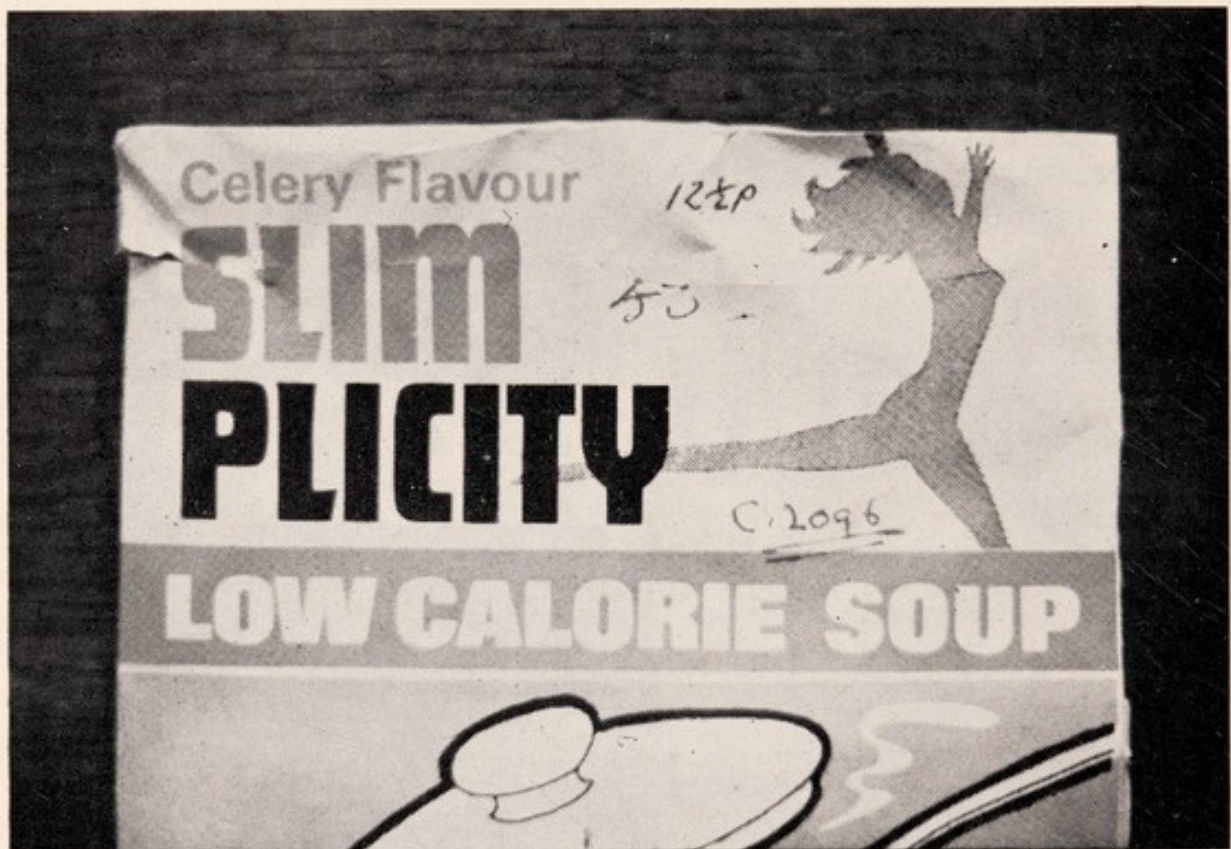


PLATE 8 Slim Plicity

to imply a slimming product. In this instance the manufacturer readily agreed to change his label, both with respect to the "calorie controlled diet" declaration, and by the addition of the word "MIX".

It is surprising how much resistance was experienced in 1972 to the suggestion that soup or gravy powders should add the words "DRIED" or "POWDER" or "MIX" to their products' designations. Five firms were contacted. Four dug their toes in. Their argument seemed to be that the EEC was proposing to allow the generic name 'SOUP' for all soup products. Messrs. Lyons in particular was so firm in its opinion, that it became necessary to contact the Ministry to try to discover just what the

EEC was proposing. A spokesman there drew attention to Regulation 14 of the Labelling Regulations and stated that designations must not be misleading. As one could buy canned soup, condensed soup, soup which had been dried, dried ingredients which make up into soup, and much else besides, one should expect the designations to differentiate between them, since one cannot have the same common or usual name for different articles. He took the view that until decisions are taken in Brussels, the formal position must be that nobody knows what anybody is going to have to do as a result of those decisions. He also stated that no Directive will come into force immediately. There must first be agreement in Brussels, and then the member countries will make their own laws within a period of one year from that agreement, and those laws will come into force within two years of the original agreement. The present draft on soups was not in a satisfactory form, and would have to be changed. Furthermore the Ministry took the view that the provision, in the British labelling regulations, which permits the continued use of a name which has been in use for 30 years, relates only to the name and not to the question of a designation. Even so, it must not be misleading. He was just as firm about Codex Alimentarius standards. The UK has taken no action on Codex Alimentarius, so its pronouncements are not authoritative until they are in the form of regulations. Those opinions were duly transmitted and stony silence has ensued.

A similar criticism of the non specific nature of the designation occurred with materials like Poachers Broth (sample 196), Parsley Sauce (sample 72) and Cheese sauce (sample 12312)—these also being in the form of powder—and 'Family Sauce' (sample E9940). The sauce situation is even more confused than the soup situation, so these items have not been pursued with the same vigour, but a number of sauce samples had not shown a list of ingredients in 1972. A sample called Madere Sauce (sample 1718) seemed to the laboratory to be designated less informatively than it might have been, but Beeton's Practical Encyclopaedia of Cooking gave a recipe: $\frac{1}{2}$ pt demi glacé sauce, $\frac{1}{8}$ pt Madeira wine, 1 tsp Beef extract, Salt, Pepper. The sample contained 2.7 per cent Proof Spirit and its general composition agreed quite well with the traditional recipe.

Perhaps rather more vigour than has yet been applied should go into persuading the manufacturers of some table jelly compound dessert powders that their more-than-thirty-years-tested product names "Honeycomb Mould" (sample C2313) and "Table Creams" (sample S9582) are not sufficiently specific to take the place of appropriate designations. The manufacturers of both products are reluctant to change their labels, but the Ministry opinion given on the subject of soups must apply equally well to items which respectively contain no honeycomb and no cream. An additional designation will have to be found and the name itself in each case may not be appropriate. The same is probably true of "Sunny Spread" (sample 094) whose name we were told had been in constant use since 1936. At present it has no "appropriate designation".

Before the problems of soup labelling fade too far from our minds, it might be worth remarking on a curious little oddity in Regulation 14

of the Labelling of Food Regulations 1970. This regulation specifically limits to the one product, namely dried solids of tea, the use, as an appropriate designation, of the words "Instant Tea".

On the other hand regulation 3 states that a name used in a compositional order shall be the appropriate designation for the product described in the order. In The Coffee and Coffee Product Regulations 1967, regulation 5 states that "Instant Coffee" shall be the appropriate designation for dried coffee extract.

The laboratory also encountered "Instant Orange" and "Instant Tomato Soup" during the year, and in each case noted that the word 'Dried' or 'Desiccated' would also be required from 1 January 1973. Strangely enough, had the tomato soup been in the form of a "mix" or appeared not to consist of one main ingredient the insistence upon the word "dried" appears to be less determined. Three samples (numbers 27, 80 and E9275) of "Instant Non fat Milk" also turned up again in 1972, but these were also labelled "Dried".

Altogether twenty-six unsatisfactory labels occurred among dairy products. There has been a little doubt about whether it really is a contradiction to use both the words "fresh" and "pasteurised" on a jar of cream. A large section of the dairy industry does appear to accept that the words are incompatible, and the doubt seems principally to be among the enforcement officials. In this case however, there is guidance in an EEC Regulation, number 1411/71. When referring to milk, it includes the words, "FRESH MILK . . . must not be warmed, not subjected to treatment having the same effect". An EEC *Regulation* is the *law* even of this land, and it seems unlikely that a decision which applies to milk will not apply to cream. In addition the Cream Regulations of Great Britain require that the heat treatment (or lack of it) shall be part of the designation of cream. Considerations of the heat treatment designation kind accounted for the unsatisfactory labels on seven samples of cream. Sample C1919, which was Pasteurised Whipping Cream, bore two designations—both of them wrong. One said 'Fresh Cream Pasteurised', and the other said 'Fresh Whipping Cream'. Cheese also ran into its share of labelling difficulties. Thus sample S8784, 'Cream Cheese with Herbs' contained only 35.6 per cent of butterfat, whereas "Cream Cheese" ought not to contain less than 45 per cent of milk fat; and the presence of the relatively small quantity of herbs, namely two per cent, could not have effected sufficient dilution to account for the difference. On its own, this could be regarded as 'adulteration' rather than a labelling matter, but the pack was also marked "70 per cent milk fat". This might seem to be more misleading than ever, but it is Continental practice to mark cheese with the percentage of milk fat on the dry cheese, and, on such a basis, the 70 per cent declaration was correct. In Britain however, there should also be a statement of the water content. The Cheese Regulations provide that a statement of fat, with nothing else, shall refer to the fat content of the cheese as purchased. Another 'Cream Cheese' (Sample 599) was found to contain only 34 per cent of fat.

There were a number of cheese samples labelled, like E948, only with terms like "Grated Cheese", without the necessary designation "Full-fat Hard Cheese". Sample 188 which came from the Continent, was labelled "Medium Fat Processed Gruyere Cheese", and, in German, there was a declaration of 45 per cent fat on the dry matter. A definite standard is implied, whether the cheese is processed or not when the name "Gruyere" is used, and this standard, set out in schedule 1 to the Cheese Regulations 1970, is for a minimum of 45 per cent fat on the dry matter and a maximum percentage of water (calculated on the whole cheese) of 38. The appropriate findings on the sample were only 38.5 per cent fat, and as much 44.2 per cent of water. The firm was advised to name the product "Medium fat Processed Cheese made from Gruyere Cheese", and to mark the particulars upon the label in the manner required in the regulations. A sad little letter from Germany protested that surely 'Medium fat Processed Gruyere Cheese' meant the same as 'Medium fat processed cheese made from Gruyere Cheese'. The explanation is that the former name mixes up two standards, whereas the latter name allows for the sale of substandard Gruyere cheese. Whether that will survive the translations which will need to be made is one problem. Another is that the ambiguous form of wording used by the firm is in fact permitted by regulation 7(4) of the Cheese Regulations, and local attempts to clarify the anomalies could be held to be an overstepping of the enforcement Officers' function. On the other hand there is an over-riding stipulation that labels shall not be misleading.



PLATE 9 Mushrooms or Cheese?

Besides this kind of difficulty, plate 9 shows how another processed cheese label appeared to be a label for mushrooms. This kind of situation

is regulated by conditions of labelling laid down in Schedule 5 to the regulations. Equally unacceptable was the microdot lettering shown in plate 10 which was all the notification a purchaser was given that the product (sample 644) was skimmed milk cheese. A case of underselling the product occurred with sample N5842, which was labelled only FRESH PACK, and verbally had been called 'Pineapple-flavour Soft Cheese'. Its proper designation should have been, "Full fat Soft Cheese with Pineapple".



PLATE 10 Skimmed Milk Soft cheese label

No doubt people will grow used to these designations eventually, but one does sometimes think sympathetically about the writer of the letter which was referred to at the beginning of this section. One imagines that she, poor soul, might only have enjoyed her modicum of "equality" when she and her sharper sighted brethren were confronted with the name SJETOST, which was borne by sample 618. The commodity should have been labelled "Medium Fat Hard Cheese", but the laboratory felt that, in addition, the spirit of Regulation 20 (1) (b) (i) should also have been observed, by adding the words 'Goats Milk Cheese'. The word 'Sjetost' may have meant something to a customer who spoke Norwegian, but the name on sample 44/2 meant very little to anybody. It was "Cream Cheese—not fat". It contained only 1·8 per cent of fat, and was, of course, "Skimmed Milk Soft Cheese".

Samples C1830, 1731, 118/72 and N5450 were all tetrapacks of a new Skimmed-milk sweetened cocoa flavoured drink. The name was incomplete and inconspicuous and the list of ingredients was not in descending order of the amounts used. The firm seems to have reacted differently to the

different authorities who had raised the matter, ignoring one, expressing great concern to another . . . The first sample reached the laboratory in June, but the same packs were in use in September. By then they had had a sticker attached which stated the volume inside the pack! In food labelling terms they were still wrong.

Sample number 202 was a canned custard, labelled, "Devon Custard Ready to Serve", and objection was taken to its containing only 2 per cent of milk fat (when South Devon Milk is recognised as being a high fat milk!). Sample 2377 was a Yoghourt labelled only as "Fruit Yoghurt" without also stating that it was Low-fat Yoghurt.

In the vexed area of cream filled flour confectionery, sample 130 sold as 'Real Cream Cake' was a kind of doughnut, with a 'cream' filling which contained 20 per cent of fat of which only a twentieth part was butterfat. When the inspector returned for a formal sample he was told that no more cream cakes would be sold until the weather was cooler. The informal follow up sample which arrived a month later was in order. All members of the public are a little guilty of helping to perpetuate the 'cream' confusion by not insisting upon the invention of another name for white cake fillings. This difficulty was underlined with Sample 543 which had been submitted by the inspector as 'Jam and Cream Sandwich Cake', but on examination it was found not only to be devoid of cream, but to have been supplied with a little label which read "Jam and Vanilla Sandwich". There was only one per cent of butter in the 'cream' of "Jam and Cream Cake" sample S9221, although the 'cream' contained 30 per cent of fat; and similarly a cake, "Butter Munch", Sample S9220, which contained 30 per cent of fat, contained only 10 per cent of butter. In these instances the manufacturers undertook to relabel the products.

Sample F118 demonstrates the confusion which exists in the labelling of biscuits. These were fatty biscuits which contained no butterfat but yet were called 'Butterpuffs'. Unfortunately this title was permitted in the Code of Practice for Biscuits, CP20, but the laboratory likes to remind manufacturers that the code has been overtaken by more modern labelling ethics, and in this particular instance the name was changed. The EEC Biscuits draft Directive seems to be one which is getting absolutely nowhere . . . and when last heard of, it was still in the mud over whether the designation of biscuits should necessarily be 'Biscuits'. Alternative names such as Cookie, Cracker, Creams, Matzos, Puffs, Rusks, Snaps and Wafers were being tossed about, and one had the impression that this may be another arena, like that of the Local Joint Committees connected with Local Government Reorganisation, wherein the members did not intend to get anything settled. The manufacturer who changed the name of his "Butter-puffs" was therefore being extremely co-operative.

In the case of sugar confectionery there is a code of practice, agreed in 1951 and circulated by the Ministry of Food in circular MF 21/51, which permits the word 'butter' or a synonym to appear in the name of any sweet which contains more than four per cent of butter fat. Sample 1697 bore the name Jersey Toffees and contained $21\frac{1}{2}$ per cent of fat in

total; but as there was 5 per cent of butterfat in the toffee then no exception could be taken to the word "Jersey". Section 47(4) of the Food and Drugs Act takes words which would lead a purchaser to suppose that cream was present to be equivalent to using the word 'cream'. "Jersey" undoubtedly is such a word. The complainant, however, had had a different bee in his bonnet. He felt that instead of being called "Toffees" the sweets should have been called "Caramels". I insert a note at this point to say that "Food Manufacture" 1973 page 45 states that there should be 21 per cent of milk solids in a caramel, but the laboratory took note of Food Industries Manual page 59 which states that nowadays the terms 'Caramel' and 'Toffees' are practically interchangeable.

Sample E9619 was a dairy ice cream whose label was criticised on the basis of forthcoming legislation. It was labelled Walls Cornish Strawberry Faire. Ingredients: Dairy Ice Cream. Made with Double Cream. The label clearly needed to be changed since there was no 'Appropriate Designation', fruit which had been used in the recipe had not been declared with the ingredients, and declaration of the one ingredient Double Cream automatically made it necessary to declare all the ingredients. A Mr. Ward of Walls Quality Control telephoned the laboratory direct to say that the new labels were already designed to take care of all the points mentioned, but he said a very disturbing thing . . . this was that at the turn of the year Walls "Cornish" ice cream would cease to be Dairy Ice Cream but would become Cornish Style Ice Cream containing no butterfat. The news brought sharply to mind a conversation overheard in the seaside town of Beer where a crotchety ice-cream vendor near the front was asked why Walls Cornish Ice Cream was so vividly yellow. Sharply putting the old lady who had asked in her place, the slightly military looking gentleman who served her said, "Of all the stupid questions. It's the first rate Cornish butter of course". One does not tell nice old ladies that the colour is a synthetic coal tar colour when a vendor looks as if he might push a bayonet into his more argumentative customers, but the incident does demonstrate that Messrs. Unilever have built up an association in the public mind between the words "Cornish" and "Dairy", and they could well be hoist with their own petard if they now use Cornish Style to describe ice cream which, because of their own advertising, has come to be associated with "cream".

The word 'Cornish' is not one to be taken in one's stride. In the Meat Pie and Sausage Roll Regulations 1967 the words "Cornish Pasty" are equivalent to Meat and Potato Pie, and imply a meat content of at least $12\frac{1}{2}$ per cent. Some are sold with less meat and are often called Vegetable and Meat Cornish Pasties—but in some cases the word Cornish is left out, and a Vegetable and Meat Pastie is sold simply as a pastie. In this context the word 'Cornish' has an association with meat and not with cream. A converse to this downgrading of an established label occurred with sample N5677. Plate 11 illustrates how the prominence given to the name of the firm, "Continental Ice Creams", made it appear as if this diabetic food containing only 1.7 per cent of fat and sweetened with saccharin was being sold as "Ice Cream". When the ambiguity was pointed out the manufacturer at once agreed to change the labels.



PLATE 11 Dietice

The draft EEC Directive on Ice Creams which was current in October 1972 was a document 30 pages long, and it proposed to recognise seven categories of ices. To qualify for the generic name Ice Cream, the European product was expected to contain nine per cent of milk fat. The product currently known simply as Ice Cream in Britain was, in that draft, to be known as Vegetable Fat Ice. We must wait and see what the Ice Cream trade finally negotiates. Similarly the EEC draft Directive on Cocoa and Chocolate, which was dated 25th May, 1972, requires the name 'Chocolate' to be reserved for materials containing at least 14 per cent of dry fat free cocoa and at least 18 per cent of cocoa butter, so that new names will have to be found in Britain for such products as 'Choc' ices and the cake coverings such as 'Scotchoc' in which other fats than cocoa butter give the special qualities which enable the coverings to stick either to ice cream or to cake.

The question of imitation chocolate has been raised but not resolved, and in the draft Directive on Edible Ices there has been a suggestion that Choc Ices may be called "Cocoa coated". Samples C2570 and N5333 were samples of such products, but in each case the manufacturers had the matter well in hand. Sample No. 40 was an Easter Egg called "chocolate" but had been made with fats which diluted the required cocoa content.

Samples 2/20, E9883, N5329, N5097, 43/72 S8861 and S40 were canned pastes intended to be spread on toast and grilled. They bore names which began with a meat product, and technically they were meat pastes if an appropriate designation had been used upon them, yet most contained only between 10% and 15% of meat compared with the 70%

required in meat pastes. The Fish and Meat Spreadable Products Regulations 1968, Regulation 6, permits this, provided that the words "Requires grilling" appear on the label. The firms which made the pastes resisted adding the words for a large part of the year, but in the end they agreed with the laboratory's interpretation of the regulations.

As has been mentioned, the interpretation of some regulations is not easy. An example is to be found with Fish Cakes. The Food Standards Committee Report on the pre 1955 Compositional Orders (published in 1970) in paragraph 37, recommends that fish cakes sold under any designation which includes the word 'fish' shall comply with the standard laid down for fish cakes . . . they go on to recommend that this should be at least 40 per cent of fish but the existing Food Standards (Fish Cakes) Order 1950 requires only 35 per cent of fish. The recommendation means that products sold as Battered Fish Cakes, Fish Savouries, or anything else which specifies the fish ingredient, should contain 35 per cent of fish . . . and the name cannot be avoided because Regulation 9(1) and Schedule 3 (Part 1) of the Labelling of Food Regulations 1970 require that a sufficiently specific appropriate designation shall be applied to such items even when they are sold unwrapped. It meant that a whole series of samples, namely samples 2296, 2334, 2343, 2355, 2358, 2408, 2429 and 79/72, most of which were being sold in Fish and Chip Shops, were not up to standard. Some, having batter and added potato, contained fish in the range of 7 to 9 per cent . . . It was possible to mark time on this, since the naming provisions of the Labelling of Food Regulations were not in force in 1972, but at the time of writing, "*Fish* . . . anything" will need to contain 35 per cent of fish.

Most of the remaining complaints about labels were to do with old labels (one still bore the words "6d. off" (Sample N5570) so it was not surprising to find that its meat content did not match up with present standards. There were the usual things occurring, most of which have been mentioned in previous years. Meat and Potato Pies which were really Potato and Meat Pies . . . there was even one Meat and Potato Pie which contained no potato and really proved to be an acceptable meat pie (sample E9937). There were labels without lists of ingredients, with ingredients in the wrong order, without names and addresses of packers, and so on. There were one or two specimens of minced beef which contained other meats, and Potted meats which were below the standard for Potted Meat and should have been called Brawn or Meat Paste. There remain five or six items however, which may best be considered in association with illustrations. One matter was brought up by a complainant whose sample, S9789, was said to be Cheese and Onion Pie which was 'not right'. He did not like the presence of an undeclared starch ingredient. The Meat Pie and Sausage Roll Regulations have landed in a fix with Cheese Pies, because they have been brought in, in regulation 8(4) under proviso (i), but the standards do not quite bend themselves to the provision, unless one uses the ruling of Regulation 4(1) to make excess fat content read as 'meat'. In fact it is much more sensible to apply the meat standard of 25 per cent to the cheese ingredient . . . and the complaint sample easily fulfilled that condition. The laboratory did not, therefore, support the

complainant's contention that there was an offence under the Trades Descriptions Act . . . But plate 12 shows the inside of a sample sold as an

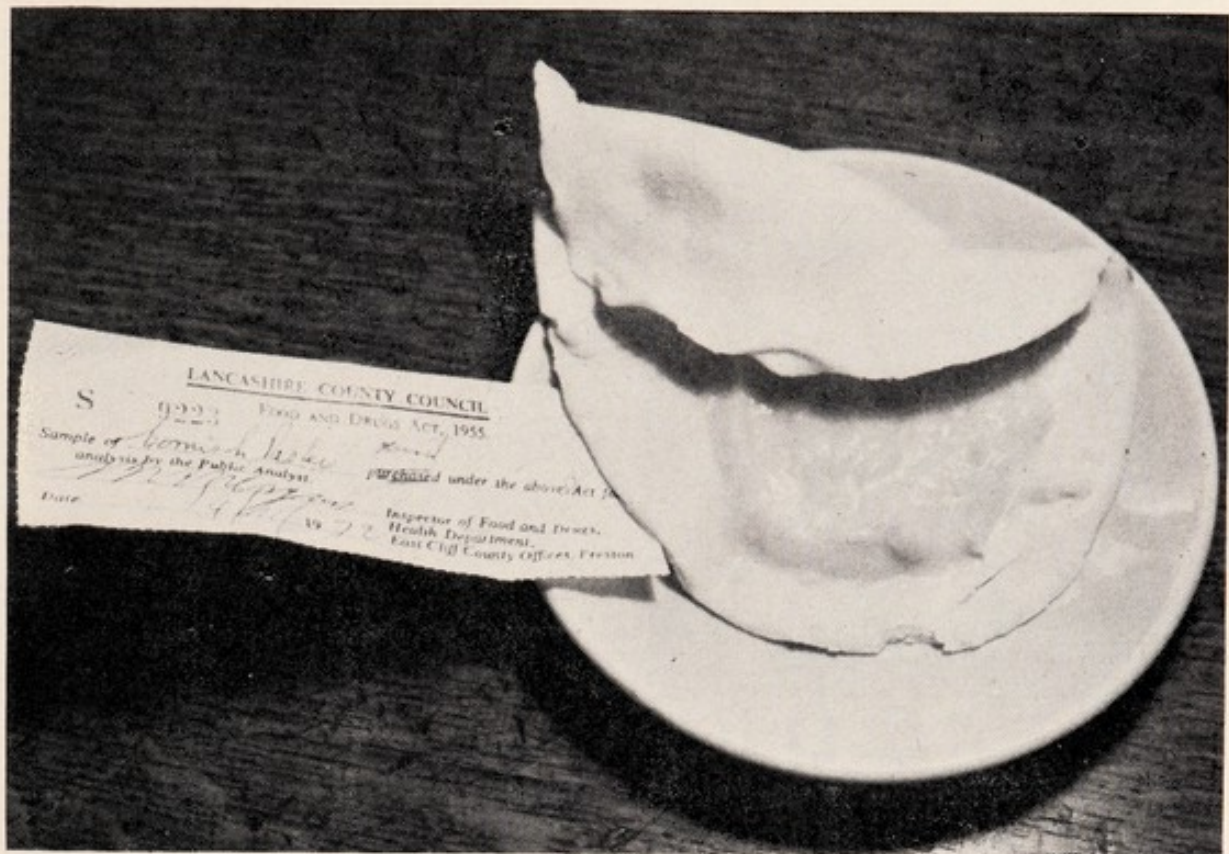


PLATE 12 Cheese pasty

uncooked Cornish Pastie (sample S9223). Its filling was a cheese filling. While speaking of cheese, it is interesting to see in plate 13 that a



PLATE 13 Bean Curd

material called "Bean Curd" was referred to as "Chinese Cheese". (sample number 484) The list of ingredients was incomplete, and the product was not cheese. Sample S9832 (plate 14) is a product which Frank Muir has immortalised by noting that the WON TON when read backwards says "Not now". The analyst who examined it considered that he had found 15 per cent of chicken in it, but he made no reference to the 'Dragon Fire'.



PLATE 14 Won Ton Soup

Plate 15 shows the label of a product, sample number 12465, which contained no whisky at all. The "whisky flavour" amounted to about 0.1 per cent ethyl acetate and about half that quantity of ethyl butyrate. It must be confessed that when the laboratory tried the effect of adding two or three per cent of whisky to coarse cut marmalade nobody on the staff could distinguish it by taste, but after representation had been made to the firm they agreed to make their label less blatantly designed to confuse the message that what was offered was artificial whisky flavouring in mincemeat from Scotland. It is surprising however, how difficult it is to pass a message which involves the juxtaposition of words along a message

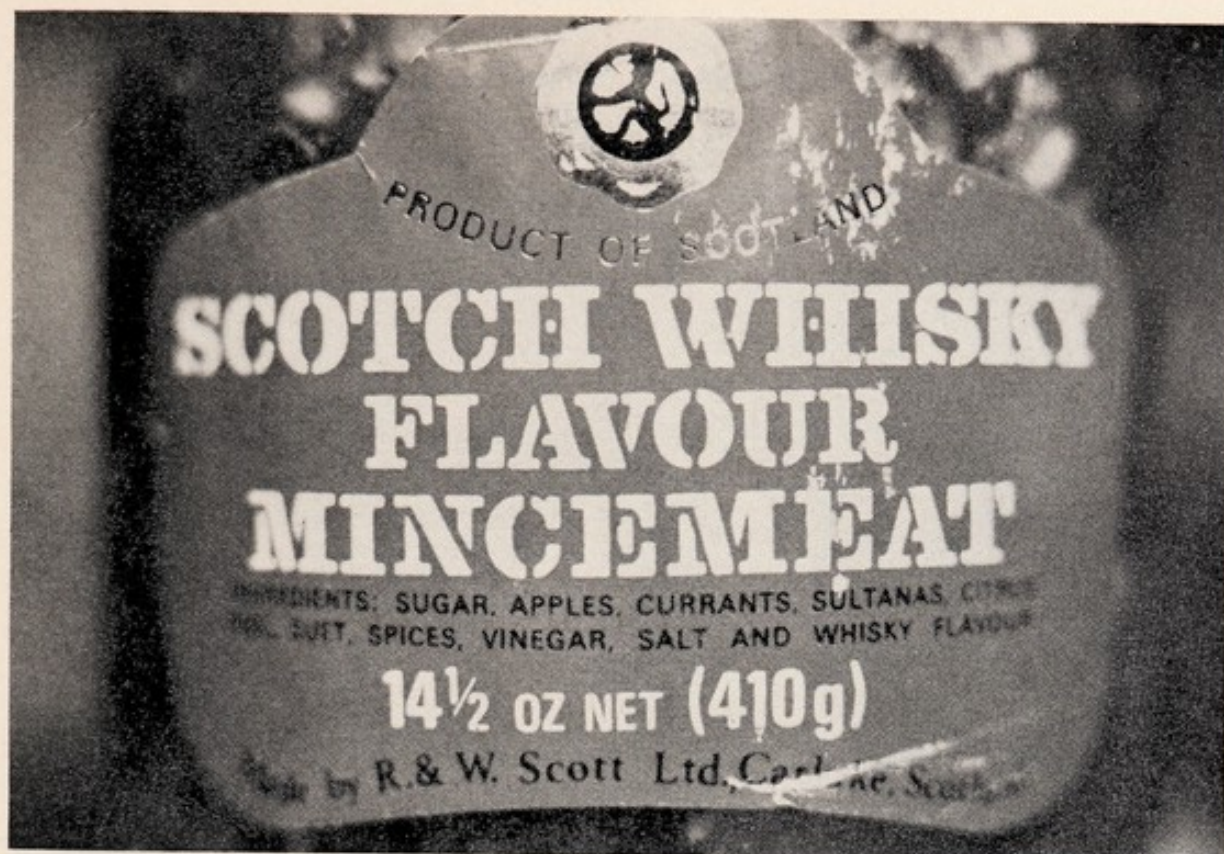


PLATE 15 Whisky flavour mincemeat

chain of uncomprehending clerks and typists in a manner which makes sense at the receiving end, and it was something of a surprise to learn that the firm had understood the nature of the criticism.

Plate 16 shows the label of sample 86/72 as an example of what the



PLATE 16 Plum Juice drink

Labelling of Food Regulations would not consider to be 'conspicuous' labelling.



PLATE 17 Baked Beans and Sausages

The next two plates, Plates 17 and 18 show things over which the

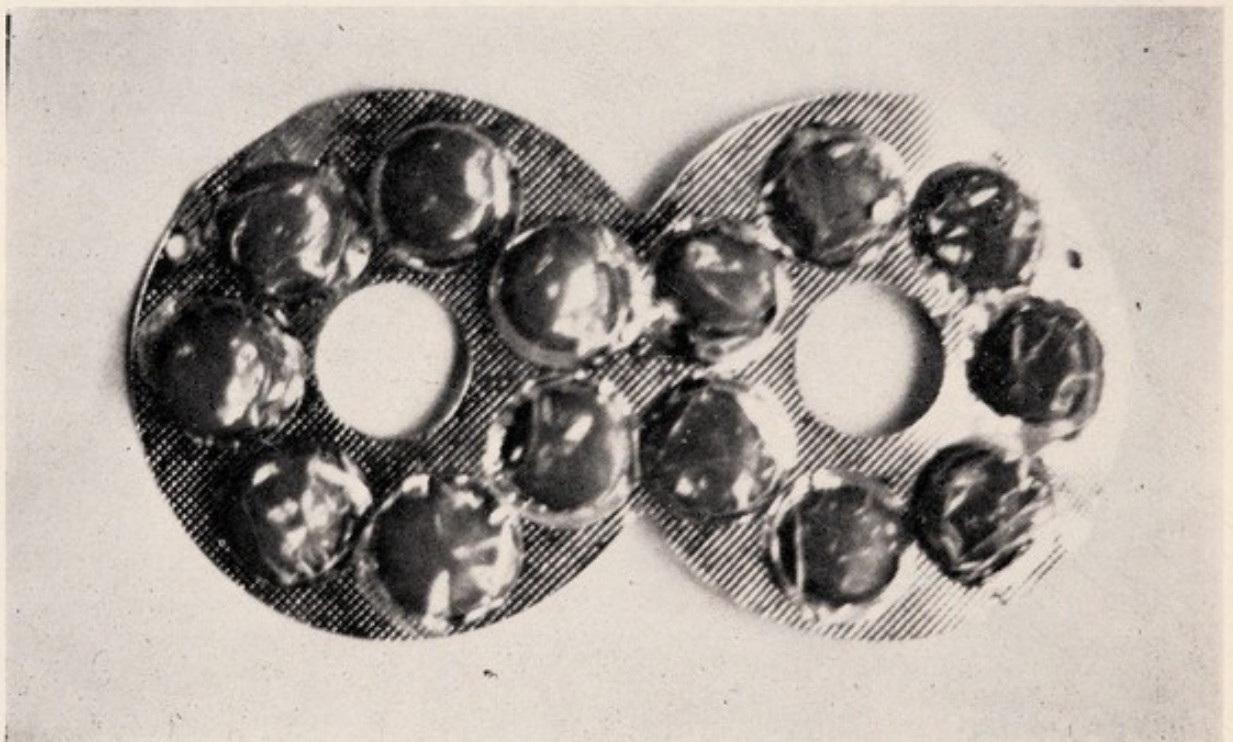


PLATE 18 Blister packed sweets

Analysts Department has no power of control. The weights displayed on apparently identical tins were different (so too were the addresses of the manufacturer). The second plate shows the opened blister pack into which sweets had been re-introduced. The sample was sold as "Candy Glasses" (sample 3/47)—a Japanese import which makes use of a form of packaging which uncomfortably approaches the style of packaging used for tablets and medicines. One cannot dictate to whom a packaging manufacturer may sell his product any more than one can insist that proper labelling should make a manufacturer cry "Stinking Fish" . . . but sometimes one wishes that greater sense than is sometimes shown were commoner.

Plate 19 shows sample 8891, which though up to the required meat content of 75 per cent, was felt to be insufficiently like the illustration to continue to be marketed under that label.



PLATE 19 Beef with gravy

The last illustration connected with labelling (plate 20) shows a home brew ingredient pack which offends against Section 164 of the Customs and Excise Act 1952 in that it calls a pack of materials which are not beer, "Brown Ale". It was also in error in its ingredients panel. It had labelled the ingredient "Ammonium phosphate" as "Yeast nutrient" (which is not an appropriate designation), and it had included as an ingredient the essential component, Yeast . . . but none was present. The manufacturer agreed to put matters right, but the laboratory felt that it was a pity that a Union Jack and not the Stars and Stripes had been illustrated. One would



PLATE 20 Trooper Brown Ale

have liked to quote the Tom Lehrer song to commemorate the omission of yeast from a brewing pack . . .

Goodbye marm (we might have sung)
We're going to drop the barm

(Unfortunately 'the barm' in the original song is the ultimate nuclear weapon).

There are still areas, unfortunately in which labelling is less informative than one would wish. One example is Junior food. Sample 66 provides an instance. Its label stated "Chicken Casserole", yet the chicken content was only 19 per cent. The name would in any case give rise to uncertainty, but at the very least one would assume it to be covered by Regulation 6(7) of the Canned Meat Regulations 1967 and to contain a minimum of 35 per cent of meat. As things are however, it is exempt from the standard by virtue of Regulation 3(c), which says that the standards do not apply to baby foods, etc.

Sample 52/72 was a sample of Separated Milk with Non-milk fat Powder. It complied with the regulations, but it bore dilution instructions to use a pound of the powder to make a gallon. The whole presentation of the product suggests that this is equivalent to milk, but the total solids of the recommended dilution would amount only to 9.7 per cent compared with which reconstituted full cream milk has a total solids content of 12.4

per cent. The firm's reply sought authorisation to use the phrase "... to produce a liquid equivalent to milk", but it was unwilling to change its dilution instructions. Food Standards Division B of the Ministry of Food was contacted but that body was not able to offer any constructive advice about the unfair comparison with milk which results when cafe proprietors are being persuaded that these "filled milk" products are cheaper in use than milk powder.

When Alexander the Great cut the Gordian Knot he did not show any particular genius, he just showed himself to be free from the inhibitions which had been educated into the people he conquered. One of the labelling inhibitions which has survived from the "food substitute" scandals of World War II is a reluctance to label food as a substitute. The Samples numbered 12345 and C2204 might almost have benefitted from a relaxation of this general rule and become named unashamedly as milk substitutes. One had produced, as its solution to the problem, a brand name "NUTRAMENT", and the none-too-specific designation "Nutritional Liquid Meal". The other had registered the name of the firm as "Plantmilk Limited", and had used prominent wording "Liquid food of Plant Origin—Use instead of milk". Both products were vehicles for added vitamins, but had obviously been difficult products to name. The most interesting thing about sample C2204 was that it began to ferment almost as soon as it was opened. The laboratory itself is not always sure about whether an appropriate designation has been used or not. Thus, sample 342 was labelled only "Lasagne Verdi—Contains spinach". It was certainly green, but it consisted of hard ribbons of some kind of pasta. It was Blackpool Catering College which eventually produced the reference which showed that "Lasagne" was the proper name for this kind of macaroni product. Another product was called "Tuna in Jelly". There are no standards for such a product, but by analogy with "Meat in Jelly" which occurs in the Canned Meat Product Regulations, it was felt that it had a sufficient fish content at 64 per cent. One also finds that some people who enter the food business in an almost accidental way, tend to have troubles with labelling. Chicken Seasoning (sample 05/3), Beef Seasoning (sample 68), Lamb seasoning (sample 198/72), and Poultry seasoning (sample 1770) were of course, devoid of chicken, beef, lamb and poultry. An idea of the origins could be gained from the name of one of the firms, "Bart Prints Ltd.", and the jar was as arty as the name suggests. The name of the product was merely on a gold coloured label, and the bottle was of a fancy shape intended to appeal to those young wives who have not outgrown a fascination in toy sweet shops. In all instances a willingness to change the name to "Seasoning for—" was expressed by the packers.

Many of these things must sound trivial, especially when the manufacturer is trying to combine art with nutrition, but while one might scoff to learn that labels on "Spaghetti Dinner with Meat Sauce and Cheese", (sample S9371), were changed because the can of "meat sauce" in the pack contained only 24 per cent of meat, and was really a "Tomato and Meat Sauce", it is also worth recalling that when a Grapefruit Drink was sold as "Grapefruit Juice", (samples S9209 and S9219), it would be easy to call

it a trifling error. The difference in the five letter word involved, represents a large price difference between the commodities however, the firm which distributed the drink as juice was fined (in total) a sum of £38.

PRESERVATIVES, ETC., IN FOOD

It is interesting to compare the syllabus of the Joint Matriculation Board for Higher School Certificate Chemistry 1930 with a modern syllabus for A Level Chemistry. The former occupied half a page and the latter goes on and on like Tennyson's "The Brook", yet the examination is now said to be less diagnostic of later achievement than it ever was, and far less diagnostic than Eleven Plus. The growing need for all documents to follow in confusion where education leads is reflected in food regulations. Concerning the labelling of sausages, in order to show that they contained preservative, The Preservatives in Food Regulations, 1962, in Schedule 3, stated:—

1. The foods containing preservatives to which the rules as to labelling set out in paragraphs 2 and 3 apply, are Sausages, Sausage Meat . . .
2. Each container to which the regulation relates shall bear a label on which is printed clearly and conspicuously a true statement in the form of the declaration THESE SAUSAGE CONTAIN PRESERVATIVE, unless in the case of a retail sale a notice to the effect that the food contains preservative is exhibited in a conspicuous place so as to be easily readable by a customer.

In the Labelling of Food Regulations, 1970, this instruction has been rendered:

No person shall sell by retail any food consisting of two or more ingredients other than food of a description specified in Part II of Schedule 3 which is not prepacked but which contains permitted preservative, permitted antioxidant, permitted colouring matter or permitted artificial sweetener, none of the said substances being naturally present in the food, unless there appears a ticket displayed on or in immediate proximity to that food and so as to be clearly visible to an intending customer the statement referred to in paragraphs (1) and (2) of regulation 7.

7 (1) Subject to the provisions of paragraph 3 of this regulation no person shall sell by retail any food to which this regulation applies unless there appears on a label the following statement or as much thereof as is appropriate:

Contains permitted preservative
permitted antioxidant
permitted colour
saccharin

Provided that in the said statement—

- (a) the word "permitted" may be omitted.
- (b) an appropriate designation of the permitted preservative, permitted antioxidant or permitted colouring matter in that food may be substituted for the words "permitted preservative", "permitted antioxidant" or "permitted colour" respectively.

(2) The said statement may include a true statement of the quantity calculated by weight of permitted preservative, permitted antioxidant, permitted colouring matter or permitted artificial sweetener present in the food.

It is not entirely clear why this declaration about the preservative content of sausages is spelled out so precisely, because the amount of

sulphur dioxide which is permitted does not really extend the keeping quality of the sausages. The sausages still go sour or mouldy. The presence of sulphur dioxide reduces the risk from *Salmonella* or from *Clostridium Welchii*, although, of course, it also reduces the value of the meat content of the sausage as a source of Thiamine. It appears that a statement of the presence of preservative in the necessary list of ingredients on prepacked sausages is a sufficient declaration for the purposes of this regulation. It also appears that the presence of colour in beef sausages (sold loose) should be declared on a notice like the one on which the presence of preservatives should be declared.

The requirement to notify the customer of the presence of preservative has existed for a very long time, yet thirty-four samples of sausages (20 Pork) were found by County Laboratory to contain undeclared preservative during 1972. It is interesting to note, however, that only six of those samples were obtained in the administrative County. If this simple instruction has been so difficult to enforce, there does not appear to be much hope for effective date marking (unless it is found that date marking becomes a selling point).

Sulphur dioxide, declared or undeclared, is only permitted in specified foods, and minced meat is not a specified food. Yet sulphur dioxide was found in five samples of minced meat examined in 1972. It was still present at a level of 320 parts per million in the formal Fresh Minced Meat sample E9769 which was taken as a follow up sample to sample E9760, and a successful prosecution resulted. It was also found at a level of 800 parts per million in sample S9786, which had been sold, moreover, as Fresh Minced Beef although it was found to consist of mixed Beef, Mutton and Pork. Up to the time of writing no indication of whether this matter will be taken to court or not has reached the laboratory.

A number of samples of concentrated comminuted orange were examined by the laboratory under the Imported Food Regulations as they came through inland Container depots. Samples 58 to 61 inclusive, 88 to 91 inclusive, 116 and 117 and 1700 were all examples of such concentrated orange which contained amounts both of sulphur dioxide and benzoic acid in excess of the permitted amounts. This situation is allowed provided that the sale is to a manufacturer who has been notified of the presence of the preservatives. Subsequent enquiries disclosed that the consignee in each case had been properly notified. In the case of samples E27, E28 and E29 this information had been obtained before the samples were submitted to the laboratory. Also from the ports came a number of citrus fruits which contained thiabendazole as a mould inhibitor. This material can be looked upon as an agricultural spray residue or as a material used to treat the fruit during storage in warehouses, but in a few instances it was found to be present with the listed "permitted" preservatives diphenyl and ortho phenyl phenol. The Food Additives and Contaminants Committee Report on the Review of the Preservatives in Food Regulations, 1962, states in paragraph 80 that thiabendazole should be regarded as being a preservative, and they recommended its use (up to a limit of 6 parts per million on the whole fruit), for the treatment of banana skins and the skins of citrus fruits.

The laboratory therefore chose to remind importers of fruit bearing more than one preservative residue, of the requirement to ensure that preservatives present with other preservatives, when added proportionately together, should never exceed 100 per cent of the permitted rate of application, and that thiabendazole was not yet technically a "permitted" preservative. But there are means other than by using reactive chemicals for preserving fruit. One such was revealed in a complaint sample, sample number N4745. In this case, scales of whitish material could be rubbed off the skin, and it amounted to about 0.007 per cent of the weight of the orange. It defied absolute chemical identification, but it resembled Shellac. Shellac is mentioned in the Further Classes of Food Additives Report (H.M.S.O. 1968) among Glazing Agents—page 7—as being a Class A Additive, suitable for food use . . . so presumably it is permitted.

In the cases of samples 3/35 and 2/72 the paper wrappers about the oranges had been treated with Diphenyl, but there had been practically no transfer to the fruit. Early in the year it was brought to the laboratory's notice that a material called "Peach Paper" was available for wrapping meat, and it was said that it contained Ascorbic Acid which preserved a fresh surface appearance on the wrapped meat. Inspectors were asked to look out for this, but they were unable to find any. The suggestion had been made a year or two ago, but it arose again as a result of an enquiry made by a local paper-maker when he wanted information about Food Wrapping Quality Paper. There is no official legislation about this in Britain, although EEC packaging materials legislation may be on its way. The question of what was meant by Food Wrapping Quality Paper was put to the Printing Industry Research Association at Leatherhead 76161, who said that wrapping paper should be ordered against specifications, and that the relevant guidance could be found in B.S.1820 "Vegetable Parchment", and in the United States of America Federal Register of materials which may not be put in contact with various foods. Germany had a similar list, and there was an EEC Committee of Experts' list of toxic substances. In Britain there is nothing but a common law requirement that you must not poison your customer . . . but on the question of whether ascorbic acid might be incorporated into food wrapping paper there appeared to be no guidance whatever.

The question of what the EEC has in store in the Preservation field remained rather obscure for most of 1972. The Royal Assent to Common Market Entry was not given until 17th October, 1972, and until then there was almost a conspiracy of silence about what had been taking place in the Six, and perhaps it came as a shock to find that there were already 42 volumes of EEC Regulations, etc., waiting to be harmonised with British Legislation when Britain entered Europe on 1st January, 1973. Thus existing Directives 70/357 on Antioxidants, 65/469, 67/653, 68/419, 70/358 on Colourings, 64/54, 65/66, 66/722, 67/428, 68/420, 70/359, 71/160 and 72/2 on Preservatives had already been agreed, and it was not until we realised that Britain was asking for some of these to be modified, and then we received the proposals for changes in the Colouring Matter in Food Regulations, that perhaps it was fully understood that the changes which are going to have to be enforced will almost all appear as Statutory

Instruments. It is evidently intended that the Food and Drugs Act will be retained in this country, and already The European Communities Bill provides for modification of Sections 4 and 123 of the Food and Drugs Act.

There are areas of confusion however, and one was revealed by sample 130/72 "Snack Meal—Pizza and Sausage", which was sold in a single frozen pack. This contained the preservative Propionic Acid which is used in bread for a few days each year when there is danger of development of rope organism. In the warmer Italian climate the possibility of infection of bread products with that organism is very much greater, so under Italian law propionic acid is permitted in bread-like products and in flour confectionery . . . but in Britain "Flour Confectionery" is defined to indicate products which are complete in themselves and suitable for consumption without further preparation or processing other than heating, but excluding products with a meat ingredient. The situation is peculiar, since it means that cake could contain propionic acid but cake flour could not. In the present instance the propionic acid in the frozen Pizza which needed only to be cooked to be ready to eat would have been acceptable if the said Pizza had been packed separately. Packed with the sausage meat in situ it was not. In order to sound less bureaucratic the laboratory took the line that propionic acid was not necessary in Britain, particularly in food stored frozen.

Sample C2315, Glacé Apricots, contained 395 parts of sulphite preservative expressed as sulphur dioxide in a million parts of the glacé fruits, whereas the food category "Fruit—Crystallised or Glacé" is permitted to contain only 100 parts. The Glacé Apricots had probably been made from dried apricots, which are allowed to contain 2,000 parts. They were simply withdrawn from sale. Later in the year the F.A.C.C. Report on the Review of the Preservatives in Food Regulations recommended that benzoic acid be permitted in glacé fruit. Carry-over provisions do exist to permit the presence of preservative in foods which do not appear in the Schedule, if the amount of preservative is derived from preserved foods which have been used as ingredient: but they do not operate to enable a food which is itself scheduled, to contain more preservative than the schedule specifies.

Occasionally it would appear that manufacturers think of the carry-over provision as permission to *add* preservative to a compounded article in which food which is allowed preservative has been used as an ingredient. Thus Black Cherry Yoghurt, sample number C1959, was found to contain 170 parts per million of Benzoic Acid. The yoghurt contained only ten per cent of cherry pulp, so no more than 80 parts per million could justifiably have been attributable to the cherry pulp . . . In any case there is a peculiar exclusion in regulation 4 of the Preservatives in Food Regulations, 1962, which makes the carry-over provision inapplicable to "Fruit Pulp intended for manufacturing purposes" so that by considering the possibility of carry-over of benzoic acid, one is forced into assuming that "Fruit pulp not otherwise specified" is used (whatever that kind of pulp may be). There must be a great deal of pressure from the trade to allow benzoic acid

in Yoghurt, because the F.A.C.C. Report on the Review of the Preservatives in Food Regulations, 1962, which was published in August, later recommended that 120 parts per million of benzoic acid should be permitted in Fruit Yoghurt. In this particular sample of course, there was an excess of benzoic acid over and above the future recommendation, but a part of it may have been due to conversion of benzaldehyde flavouring which had been incorporated into the recipe. Unfortunately the matter was never resolved, because the report went out of the laboratory and into Limbo, which is exactly as the new Directors of Trading Standards will probably *want* the analysts reports to be dealt with. There were special circumstances to account for this particular event, and it was merely unfortunate that it happened with an interesting problem sample.

A very similar preservative problem arose with sample 36/72 which was a Home Brew Beer Pack in which all the dry ingredients had been mixed together, and the preserved dried hops which were present thus imparted to the commodity as a whole a content of sulphur dioxide amounting to 100 parts per million parts of the dry mix. Beer making ingredients are not a scheduled article permitted to contain preservatives . . . but neither are dried hops, nor any other ingredients which had been used in the kit. Considerable correspondence followed, in which, among other things it was suggested that this was not 'retail sale', but was "Sale to a manufacturer for the purposes of his manufacturing business", and that hops were herbs (excluded from the definition of 'preservative'). A long and erudite letter appeared in which it was stated that the Final Report of the Departmental Committee on Preservatives and Colouring Matters in Food (published in 1924) accepted that hops always contain sulphur dioxide . . . The laboratory came to feel that what it was saying was the equivalent of "Twopence per person per trip or per part of per trip". Hops were not scheduled. Beer making ingredients were not scheduled. They were not permitted a content of sulphur dioxide. Even the Ministry became involved, since the observation meant that all the beer being brewed was being brewed with an illegal ingredient, and the laboratory was given foreknowledge that the F.A.C.C. Report on the Review of the Preservatives in Food Regulations 1962 would soon be coming out, and would deal with this problem. The laboratory therefore decided to call hops "Dried Fruit", and was amused to see that the abovementioned report, on page 24, had virtually decided to do the same thing for the time being, but felt that a special provision was needed to accommodate the sale of dried hops by retail. The Committee recommended 2,000 ppm. as a suitable level.

Sample 12377 Raspberry Flavoured Topping was another non-scheduled food, this one intended for decorating the tops of trifles or ice-cream sundaes, and again it contained preservative. There were 440 parts of benzoic acid present. The list of ingredients contained no scheduled foods which would be a point of argument, and the analysis of the sample revealed none . . . so the commodity was withdrawn from sale.

Sample number S9714 was a sample of canned shrimps in brine which contained 8.5 parts of formaldehyde per million parts of the fish. In 1962

there had been some doubt about a conversion of natural trimethylamine in shrimps, so that during the test procedure amounts of formaldehyde up to 12 parts per million might be generated. It was further concluded that if the pack was slightly acid in reaction such conversion could proceed in the can and produce formaldehyde up to levels as high as 90 ppm. In practice no formaldehyde has been found in canned shrimps for several years, and the thought occurred to the laboratory that this occurrence might indicate staleness in shrimps before canning. The 20th Edition of Food Industries Manual uses the estimation (see p.245) as a means of estimating fish spoilage. The importer said that he would make enquiries at the Pakistan factory where the shrimps were said to originate. Smoked Cod Fillets, sample 2375 were later found to contain 26 ppm., and sample C1807 contained 30 ppm. The situation must therefore parallel that which has been found to obtain with kippers. Some contain no formaldehyde, others contain up to 50 ppm. but the majority contain quantities of the order of five or six parts per million, and it is tempting to suspect that freshness may be a factor.

While speaking of kippers perhaps it should be mentioned that after the Government Laboratory suggested that there were pitfalls in the determination of nitrosamines, the County Laboratory ceased to preserve the interest which it had begun to take in the question of nitrosamine content and nitrates, so, as sampling began to pick up again after the first two quarters of the year, this investigation was dropped for want of manpower. It had been reduced to a relatively routine procedure by which, by taking a 2 microgram spot upon a thin layer plate, (representing the concentrated extract of 40 grams of fish) any spot which travelled appropriately in a dichloromethane: ether solvent, and was located with Greis—Ilosvay spray, would be equivalent to 50 parts per thousand million. Quantities appreciably less than this were present in kippers containing amounts of nitrate which were coming out at between 10 and 16 parts per million. It was a pity to abandon the investigation, but it was not revealing anything which would at the moment be regarded as startling. The samples of smoked cod and smoked haddock submitted during the year were all dyed with the artificial colouring Tartrazine, which is a permitted food colour. Synthetic Food colours were the subject of comment in only five instances, three of which were complaint samples. Thus sample 8826 consisted of two black puddings and separately the purple-blue water in which they had been boiled. This liquor had a somewhat beery odour even on the day it arrived in the laboratory, but after a further weekend of storage it had also changed colour to a red-brown. It was still possible to establish however that the dark skins of the puddings had been made black by means of four synthetic permitted water soluble food dyes, namely, Amaranth, Tartrazine, Black PN, and Orange RN. Blue marks in sample N5855, which was part of a meat pie, were due to a carcass stamp. Methyl violet was not then permitted as a food colour, but the proposals for changes in the Colouring Matter in Food Regulations later advocated its use as an external food making colour, and this was the dye found in the pie. The laboratory had no success in identifying the blue mark about which a complaint had been made in some skinless sausages, sample S450. The mark was actually on a tiny fragment of adipose tissue

which itself only weighed 14 milligrams . . . but the actual mark looked rather as if a ball point pen had rested on the sausage. It was possible to show that it was a synthetic colour, but there was too little of it to permit identification. Only two routine samples were found to contain prohibited colours. One was a sample of a flavouring essence, sample E204, which contained the red colour Ponceau MX which had been withdrawn from the permitted list on 1st January, 1971, and the other was a sample of sugar cake decorations, sample N5707, which contained the blue colour

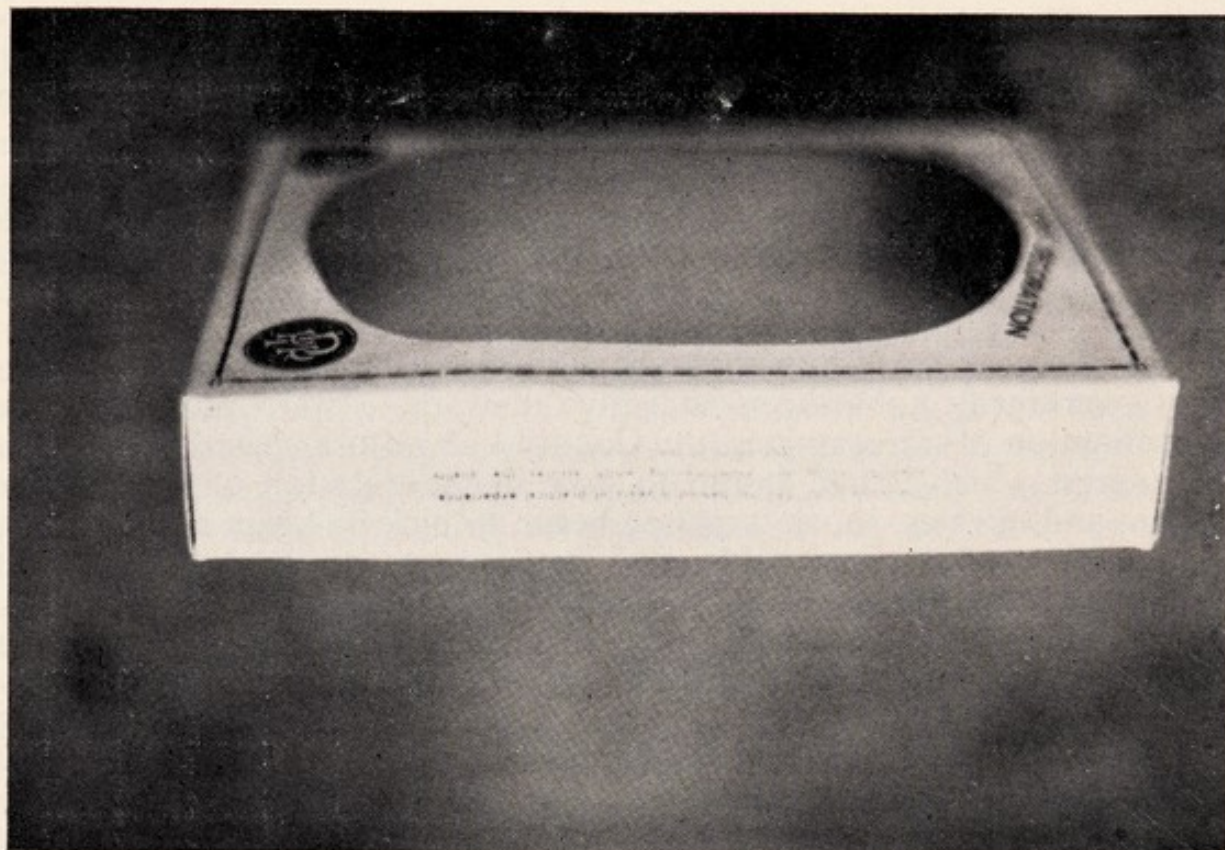
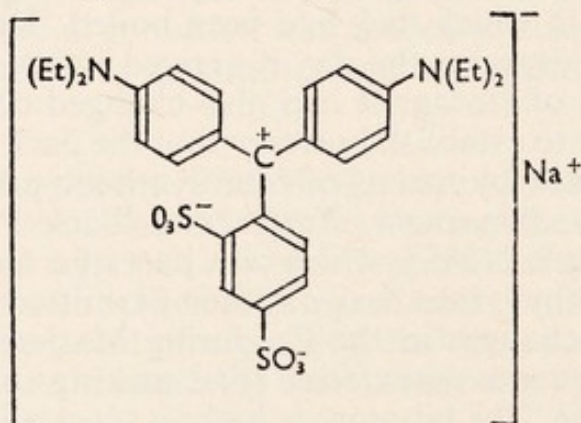


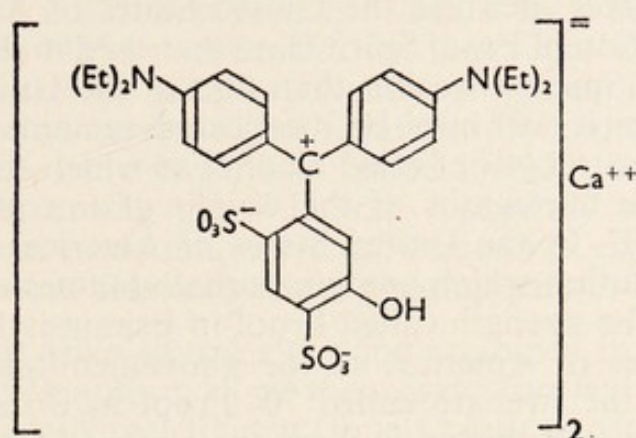
PLATE 21

Blue VRS. The legend which appeared on the packet is shown in plate 21 where it may be seen that there is a claim that the firm's years of practical experience, scientific testing and experimenting ensures the quality and purity of its products. They could be right. Blue VRS has the formula:—



BLUE VRS

and Patent Blue V has the formula:—



PATENT BLUE V

Blue VRS was removed from the British list of permitted food colours in 1967 and Patent Blue V will become a permitted food colour when harmonisation of European food colour law takes place within the next year or two.

ALCOHOLIC DRINKS

The sampling of alcoholic drinks appears to grow less adventurous as the years go by, but the number of samples examined seems to remain very much the same each year. In the year 1972 a total of one hundred and seventy-two samples was examined, ninety-four of those being spirits samples. These last were made up of eighteen routine samples of brandy, nineteen of gin, twenty-two samples of rum, four of vodka and thirty-one of whisky. As in previous years the strengths were all very close to the declared strengths, with the brandy samples riding about half a per cent proof stronger than the other spirits. Eleven of the spirits were being sold in the old fashioned one fluid ounce measures; the remainder had been dispensed in the newer five-sixths ounce measure.

There were two watered specimens encountered, and both were samples of rum. One however was not a routine sale, but was rum submitted in a bottle fitted with a metal pourer, the main purpose in that case being to see whether the rum had been contaminated with metal. The investigation is discussed in the Miscellaneous section of the report. When the rum was found to be of strength only 61·2 per cent proof, the district inspectors who had submitted it were invited to bring formal samples, but they declined to do so. The second watered rum was submitted as a direct result of a complaint that rum was being watered in the premises concerned, and indeed, the sample submitted was found to contain nearly seventeen per cent of extraneous water. At the time of writing the case had not come to court.

One cannot assume from this that the paying customers are always right when they complain. A sample of white rum, sample 1708, which

was sent to the laboratory as "watered" was right up to strength, although it was interesting, inasmuch as the strength had been declared in American Proof Spirit degrees. Because the United States of America has adopted a different definition of Proof Spirit from that used in the United Kingdom, American Proof Spirit is weaker than that of the United Kingdom. How British Proof Spirit will ever be metricated remains to be seen, but at present it is that strength of ethyl alcohol at which the weight of a given volume is twelve thirteenths of the weight of an equal volume of water measured at 51°F. In the United States of America it is the strength of ethyl alcohol solution which contains equal volumes of ethyl alcohol and water at 60°F. The strength called Proof in Britain is 114 degrees proof in the United States of America, so the abovementioned sample of white rum which had the strength called 70° Proof in Britain was marked 80° proof on the White Rum bottle from the United States of America from which the sample was taken.

There were other complaints made about spirits. Thus sample number 1709 was whisky alleged to be watered, which in fact was genuine whisky and sample 8908 was the remains of a tot of rum purchased at a bar, and that was also found to be genuine. Sample number 379 was a specimen of "rum and coke" which was believed to have been made with ordinary rum when Bacardi Rum had been requested. From known analyses of Coca Cola it was estimated that the drink contained 80 per cent of Coca Cola, and this estimation agreed with the amount of alcohol found (if we assumed that the other 20 per cent of the drink was undiluted rum). Gas chromatographic traces from a distillate of the sample matched with those from a distillate from the Bacardi Rum sample S9543 which had been retained in the laboratory, and a dilution of Coca Cola with twenty per cent of the same sample of Bacardi Rum gave an exactly similarly coloured solution, both in intensity and light bands absorption, so it was concluded that the complaint was unfounded . . . and the drink probably had been made with Bacardi Rum. A Statutory Certificate was issued about sample S13 however, which was submitted as "Ginger Ale with Bacardi Rum". In that case there was mould mycelium floating about in the drink, and from its viable condition it was concluded that it had been in the Ginger Ale part of the drink. A separate sample of Ginger Ale was obtained, and since similar mould growth was found in that, another Statutory Certificate was issued. One month later notification came through that the complainant was unwilling to give evidence, so there was no prosecution. The customer's palate must not be underestimated. Sample M036 was a part bottle of Gordons Gin which was said to taste unusual for gin. When tested by Gas-liquid chromatography it was found to contain about 25 per cent more of the aromatic ingredients of gin than occurred in any of the other specimens of gin which were in the laboratory at that time. For those who like gin it is probably a recommendation. For those who prefer vodka it is not. Sample M417 was a sample of brandy which contained deposit. It had been provided originally by a very elderly person who, one supposes, must occasionally have taken a nip straight from the bottle, because the deposit consisted of partly hydrolysed biscuit which the laboratory suspected of having come from under somebody's false teeth, and the most likely somebody in a case like that is the owner of the sample.

One rather unusual departure in alcoholic drink presentation was encountered during the year. The drink, submitted twice with sample numbers C2779, and E.571, was sold as "Clan Dew Wine and Whisky". It bore a declaration '31° Proof Spirit'. On that score the manufacturers were generous, because the samples actually contained about 33 per cent of proof spirit. Opinion expressed in the laboratory about its taste seemed to harden around a conclusion that it tasted of cider, which recalls how cider products were, during the 1939 war, frequently accepted as wine, thus lending substance to doubts which are sometimes expressed about the authenticity of the wine drinker's discriminating palate.

There were thirty-two samples of wine examined in 1972, but unlike those sampled in 1971 almost all of them were fortified wines. Of these, six samples consisted of real Sherry (four Cream and two Amontilado) with alcohol contents of approximately 35 to 36 per cent proof, and four were Continental Wines containing added bitters, with alcohol contents of 31 per cent proof. The same level of alcohol content was found in two samples of Medium Dry British Sherry, in two Cyprus Wines, (one a Ruby and one Sherry style) and in a bulk container of Mead, and in a Tonic Wine which had had glycerophosphates, caffeine and quinine added to it. Thirty-one per cent proof spirit was also found to be the strength of a sample of draft Sherry-style wine which had been kept by a complainant for a period of about three months after purchase, and had been thought to have caused illness. The results of the analysis suggested that the wine may have been an Australian wine, but it had suffered a little from aerial oxidation of a small amount of alcohol, to give an acidity of 0.55 per cent acetic acid. Apart from a resulting vinegaryness in the odour, there was no reason for illness to follow its consumption. Rather more extraordinary was a sample of Cyprus Sherry said to be "off", which contained a deposit of yeast. The alcoholic strength of the wine was too high to permit the yeast to grow, so it had remained in a dormant stage. It was alive, however, and it grew quite well when cultured into malt solution. A second Cyprus Sherry was said to have made a consumer sick. It, too, had a deposit in it, but the deposit was merely confirmation of the story, because it consisted of a small amount of vomit. Presumably the complainant had been drinking direct from the bottle, or perhaps a quantity of a drink he had contaminated had been returned to the bottle. There was nothing toxic present, but the wine was more dilute than ordinary Cyprus Sherry, having an alcohol content of only 24 per cent of proof spirit.

The alcohol contents of the remaining routine samples were as follows:— Medium Sweet British Sherry 27 per cent, Port style British Wine 27 per cent, British Ruby 27 per cent, British Cherry Wine 27 per cent, British Cream Sherry 25 per cent, British Cream Sherry 24 per cent, British Apricot Wine 24 per cent, and Bulgarian Table Wine 21.5 per cent.

As far as the department's limited records now reveal, 1972 was the first time that a sample of Campari was examined. This drink is sometimes classified as a "spirit", but analytically it is more like a wine. The sample contained 41.5 per cent of proof spirit, and the bitter principle found was quinine. No wonder some people think the joys of drinking are about as pleasant as taking medicine.

The parable of the turning of water into wine ends with an incredulous remark about keeping the best wine until last, lending authority to the suggestion of Derek Cooper's that people may be right to suspect those loose labels which float off wine bottles chilled in the ice bucket of licensed restaurants. Even in the present day, occasional complaints arise which suggest that the palate becomes fairly jaded as the milligrams of alcohol mount in the blood stream. Sample C1860 showed, however, that there is a limit to what the palate will stand. It was a complaint from a club. The upstairs bar had been serving two ladies with Dubonnet. The ladies then moved downstairs and bought more Dubonnet, and did not like it. They confronted the manageress, who did not lend a sympathetic ear, and so they left . . . but the manageress sent the wine out to them in a soft drink bottle, by messenger. Nothing daunted, they took it to their Public Health Inspector, who, poor man, had no proof that this was the wine they had bought, and had no actual right of entry to the club. It was a most interesting sample, nevertheless. It had been Dubonnet in its salad days, as could be established by the colour identity with authentic Dubonnet, but it had been diluted to about a third of its original strength, and then had started fermenting again, so that the sugars had been consumed while the alcohol crept up again until the solution was about half as alcoholic as the original Dubonnet. Much of the remaining colour had been taken up by the yeasts, and the original degree of dilution had to be calculated from the tartrates and minerals present. The fluid certainly had an unpleasant taste, and it is hard to understand how it came to be sold, or how the manageress could have failed to accept her customer's complaint. She did admit when interviewed however, that there had been a tendency for hackles to rise with both protagonists. The complainant herself had once been employed in a bar, and was apt to remember inconvenient trade practices . . . but as the manageress pointed out to inspector Solomon; "If anybody was going to fiddle, they would have opportunity to do it more profitably than by watering Dubonnet!"

Nevertheless, it does just sound as if the Municipal Journal's late cartoonist, Baxter may have been making a constructive suggestion when he produced the drawing in plate 22.

There is only one further point to be made about the wine samples this year. The journal, "Food Manufacture" suggested in July, 1972, that the preservative Sorbic Acid was used in wine. None was found in the wines tested for it in Lancashire in 1972.

Warwickshire's Department of Trading Standards achieved fame in early February by suggesting that with an alcoholic content of 2.5 per cent, some bottled pale ales almost qualified to be sold as soft drinks. It rather sounds as if the comment arose as a result of confusion between per cent alcohol and per cent proof spirit. British proof spirit contains 49.28 grams of alcohol in a hundred grams of the solution, or 57.1 cubic centimetres of alcohol in a hundred cubic centimetres of the solution. So, according to whether the pale ale in question contained 2.5 per cent of



PLATE 22

alcohol by weight or by volume, the amount of proof spirit it contained could have been 5·5 or 4·3 per cent . . . both more than twice as much as the maximum which might be permitted in a soft drink. From the results obtained on the forty samples of beer examined in the Lancashire laboratory in 1972 it would appear that the Warwickshire beers must have had their alcoholic contents expressed in terms of per cent alcohol by weight. The alcoholic strengths of the beers examined in the County Laboratory in 1972 was as follows:—

*Table No. 25**Beers—1972**Proof Spirit Contents*

Sample						Type	Proof Spirit
E.9494	...	...	...	...	...	Mild Beer	5·84
E.9498	...	...	...	...	...	Mild Beer	6·83
E.9506	...	...	...	...	...	Mild Beer	5·71
E.9508	...	...	...	...	...	Mild Beer	6·70
E.9512	...	...	...	...	...	Mild Beer	6·9
E.9514	...	...	...	...	...	Mild Beer	5·09
E.9593	...	...	...	...	...	Mild Beer	6·0
E.9655	...	...	...	...	...	Mild Beer	5·96
E.9692	...	...	...	...	...	Mild Beer	5·96
E.9495	...	...	...	...	...	Bitter Beer	6·20
E.9496	...	...	...	...	...	Bitter Beer	7·21

Table 25 — continued

Sample	Type	Proof Spirit
E.9497	Bitter Beer	7.33
E.9507	Bitter Beer	7.33
E.9509	Bitter Beer	6.33
E.9513	Bitter Beer	6.8
E.9515	Bitter Beer	7.0
E.9594	Bitter Beer	7.2
E.9656	Bitter Beer	6.70
E.9694	Bitter Beer	5.96
E.9693	Bitter Beer	5.71
E.9510	Strong Beer	11.36
E.9697	Strong Beer	13.80
E.9657	Keg Beer	6.33
E.9516	Strong Ale	11.5
E.9659	Brown Ale	5.0
E.9695	Brown Ale	4.36
Middleton 197	Brown Ale	5.32
Middleton 226	Brown Ale	6.45
E.9596	Brown Ale	5.7
Westmorland 1678	Pale Ale	7.12
E.9597	Pale Ale	7.3
E.9696	Pale Ale	7.2
E.9658	Lager	8.1
E.9661	Lager	7.4
S.9225	Lager	4.5
E.9660	Light Ale	7.7
Middleton 228	Light Ale	5.22
E.9595	Draught Stout	8.0
Middleton 227	Export Ale	11.4
Preston C.B. 8911	Guild Ale	16.4

The poor alcoholic strength of the lager beer number S9225 was partly due to its being old when received at the laboratory. It was submitted as a complaint sample, having been supplied in a dirty bottle. To the brewer however, "strength" does not mean alcohol. He pays duty on the sugar which was originally present, so the brewer thinks of "strength" in terms of "Original Gravity" (which always sounds like the opposite of original sin). A complaint sample of home made wine, sample M484, thought, because of its peculiar flavour to be a possible health hazard, had not, as was suspected, begun to dissolve toxic metals from its containers. It, like the abovementioned beer, had lost the protective layer of carbon dioxide across its surface, and had begun to oxidise to acetic acid. These "brew ups" are probably nearer to Ale than to wine, being a ferment of miscellaneous sugars by means of added yeast. The alcohol content of this particular sample was twenty-six per cent proof, and a little fusel oil had been generated to make it even more dangerous.

A beer of particular interest in 1972, was that one illustrated in plate 23 bearing a label: "Specially brewed to celebrate Preston Guild, 1972". So little notice appeared to be taken, in County Hall, of Preston Guild,

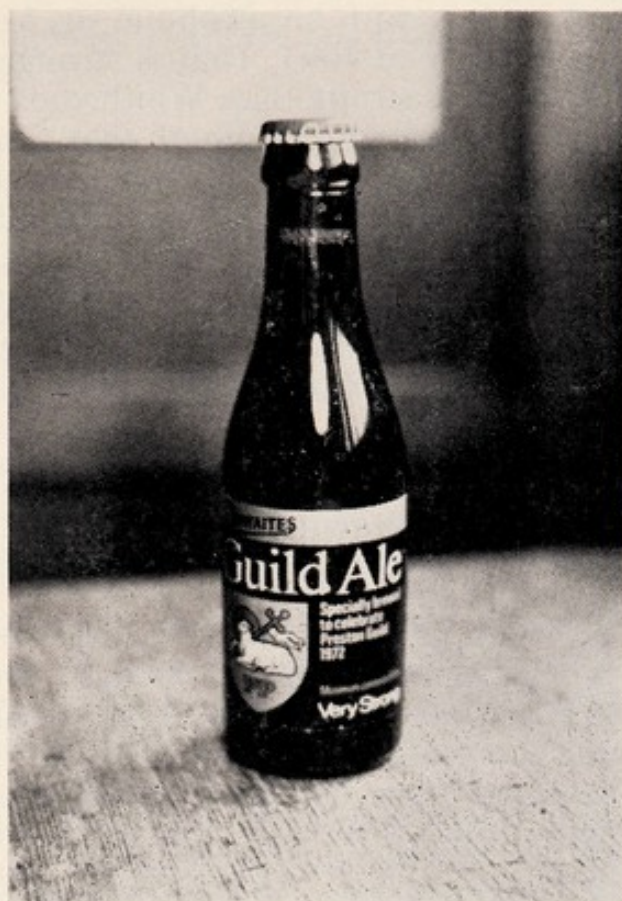


PLATE 23 Guild Ale

1972, that one wonders whether it should be explained. Guild Merchants were initially groups of related people who banded together for mutual aid, but around the time of the Norman conquest it became necessary to obtain Royal Permission to form them, so that one reads of eighteen such Guilds having been fined by Henry II for forming themselves without special authority. Their objects were trade monopoly, but they also undertook many local government functions. When eventually the craftsmen became jealous of the traders, they in turn formed Guilds of their own, whose objects were the same as those of trades unions. The Preston Guild Merchant is believed to have begun in 1100 A.D. and its foundation has been celebrated periodically ever since 1542 A.D. Currently attempts are made to celebrate it every twenty years, on the first Monday following the celebration of the beheading of John the Baptist. None of the events so celebrated appears to a mere onlooker to be an occasion for great rejoicing, and in 1972 it produced a further embarrassment by causing County Offices to be festooned with red bunting on the day of the visit of a Conservative Prime Minister. (Perhaps that is why the good Minister choked a little on his meal in Preston). To the citizens of Preston, a major attraction in the past was that the pubs stayed open all day. In 1972 just those along the route of the somewhat Irish-style processions remained unaffected by normal licencing hours, but trade was said to have been very little increased, and the event may have influenced a swing of opinion toward the view that the existing limited licencing hours are for the most part convenient to the trade and no hardship to the drinking Briton.

"Guild Ale" was strong, with an alcoholic strength of 16.1 degrees Proof and an original gravity of 1093. That is stronger than "Old Dan" or "Old Tom" but rather less strong than Whitbreads Gold Label Barley Wine. The myth was passed by word of mouth that Guild Ale was brewed in the traditional manner, but it seems unlikely that the Brewing Syrups consisting of miscellaneous dextrins and glucose and made with Ulverston enzymes from cosmopolitan starches, were not used. The question of whether beer should be made solely from malted barley has been a major stumbling block with the German brewers in the harmonising of EEC beer law. German beer appears to be the only beer in Europe which *is* traditional.

Only three samples of cider were examined in 1972, two being Hereford Cider with alcohol contents of 9.5 per cent Proof, and one a Somerset Cider with an alcohol content of 7.2 per cent Proof.

There were twelve samples of alcoholic soft drinks submitted during the year, nine of which were pre-packed Shandy drinks. One, sample E9415 had acquired a growth of wild yeasts which had generated more alcohol, thus bringing the proof spirit content up to 3.4 per cent, but all the others were satisfactory. One old stock can of lime and vodka drink had an alcohol content of only 0.4 per cent proof, but the can was clearly marked to indicate this.

Liqueur chocolates are usually mentioned in this section of the report, although they hardly count as drinks. The ruling about such items is that no licence is required if they contain less than 1/50 gallon of proof spirit per pound and the individual pieces weigh less than 1½ ounces each. (1/50 gallon per pound is about 9.06 grams of alcohol per 100 grams of chocolates). Only four samples were submitted in 1972, their alcohol contents being 3.5 grams per 100 grams, 2.9 grams per 100 grams, 8.7 grams per 100 grams and 9.9 grams per 100 grams. Only the last had been sold on licensed premises.

If we include Liqueur Chocolates in this section, why not Rum Butter and Brandy Butter? Four samples of the former were examined, and three samples of the latter. They contained very variable amounts of spirit, ranging from 0.8 grams of alcohol per 100 grams to 2.25 grams per 100 grams—a range of rum or brandy content extending from about two and a third per cent to about seven and a half per cent. One would imagine that the Customs and Excise authorities would have no interest whatever in such products, since the duty would have been paid on the spirit in any case. There is no real analogy with liqueur chocolates, so the fact that these peculiar preserves are normally sold in quantities ranging from 100 grams to half a pound may not matter—especially if one considers that one would seldom spread an individual bun with a quantity approaching one and a half ounces.

DAIRY PRODUCTS

The term "Dairy Products" is used as a classification which includes Flavoured Milk-drinks, Cream, Prepared custards, Milk puddings, Butter,

Cheese, Yoghurt, Ice Cream, Dried milk powders (skimmed, full cream and skimmed with added non-milk fat) Condensed and evaporated milk, and Frozen desserts.

Approximately 450 samples of Dairy Products were examined during the year 1972, and a number of these have already received comment in the section of the report which deals with Labelling, since there were five samples of chocolate drink, ten samples of cream, one sample of prepared custard, four samples of cheese, one sample of processed cheese, a sample of Yoghurt, one of "Buttermilk", two samples of ice cream, and one of frozen dessert which bore unsatisfactory labels.

The cream samples were all subjected to a Methylene Blue test, as was requested by the Ministry of Agriculture Fisheries and Food Circular FSH 2/71, and eighteen samples failed to pass the test. All but two of the cream samples which were labelled "Pasteurised" passed the test for correct pasteurisation (an observation which makes one wonder whether FSH 2/71 needed to be quite as cautious as it was) and one sample was actually sour. One sample of single cream failed to reach the minimum fat standard of 18 per cent milk fat.

There were nineteen cream cakes submitted but only in three of those, samples 543, 130 and S9221 was the fat content of the cream found to be other than butterfat. One sample, sample 1696 was submitted with a complaint that the cream tasted of disinfectant, but the laboratory was unable to confirm the taste, and found nothing abnormal with the sample.

One sample of an artificial cream compound, sample N5175, was submitted as a consumer's complaint and the fat was found to be rancid. It was also found however that the carton had been damaged and was no longer hermetically sealed.

There were also three samples of Coffee Whiteners examined, which were made of dry glucose syrup, vegetable fat, emulsifiers and flavouring. The name of one of these, namely, "Non-dairy creamer", which was applied to sample number S102, was felt to be meaningless as an 'appropriate designation'. Fortunately the manufacturer agreed, and promised to re-design the labels.

The three milk puddings or desserts samples which were found to be unsatisfactory were all complaint samples. Thus sample E578 was a sample of canned rice pudding having a slight caramel flavour (although the complainant had said that it tasted of 'tin'. In fact it contained only insignificant quantities of metals). It was unusual however, inasmuch as all the cane sugar present had been converted to invert sugar. It might have been overcooked, therefore. Sample 23/72 was a complaint of a much more straightforward kind. It was a can labelled as being "Creamed Rice" but the can's contents consisted of 95 per cent milk (3% fat) and 5 per cent sugar . . . but there was no rice. The firm replied to say that liquid and solid constituents of this product are filled separately into the cans, and that for some unknown reason the solids filler must have failed. The explanation makes one wonder about the title "Creamed" Rice. It was

clear from the analysis of the liquid portion that no cream was present. If the rice goes into the can as a solid, it does not sound as if it receives a treatment which one could call "Creaming", and that can be the only other slim justification for the use of the word. Sample C2427 is remarkable because it not only involved a fault in the food, but it shows how oddly foods which a packer packs sometimes get used. The basic fault was that in case-opening procedures at the shop where the Creamed Rice Milk Pudding had been sold, the carton opening knife had penetrated the side of the can making a barely visible perforation only 2 millimetres long. The result had been bacterial spoilage of the can contents. The curious use to which the food had been put was to mix it with curry. The sample arrived as a quantity of almost liquid, sweetened creamed rice milk pudding mixed with curry in the opened rice pudding can, and separately in a yoghurt carton there was a small quantity of the creamed rice milk pudding culture as it came from the can. True, one does eat curry with rice . . . but how many eat it with creamed rice milk pudding? But there are none so queer as folk. Samples 1665 and 1666 consisted of milk, and egg-and-milk custard mixture respectively, with a complaint that the custard mixture would not set. In fact the custard mixture did set when it was put through the warming procedure appropriate to the making of custard. The composition of the mix proved to be milk fat 3.6 per cent, milk solids-not-fat 8.3 per cent, Sucrose 6 per cent and Whole eggs 25 per cent. One would perhaps normally expect 30 per cent of eggs, so perhaps small eggs had been used, but one does sometimes wonder whether the complaining public consists of brides straight out of Grammar School, holding an A Level Certificate in Greek in one hand, and a chef's wooden spoon in the other.

Among the forty-three samples of butter which were analysed, there were four which caused comment. One contained a slight excess of moisture one contained a small quantity of dirt, one was just beginning to go rancid, and one, sample C2180, of Farm Butter, weighed only 15½ ounces although the wrapper was marked 1 lb. Sample 096, Buttered Barm-cakes, was a complaint sample submitted by a customer who had purchased barm cakes in a cafe and had been told that they were spread with a mixture of margarine and butter. He then specifically asked for Buttered Barm-cakes and was charged 7p extra. He then brought them to be analysed. The sample was correct. Butter had been used.

In the area of cheese examination, there were only labelling offences, mould growth, and complaints about foreign matter to report. Similarly with cheese spreads, a statutory certificate was given in one case which involved heavy mould growth, (but the case did not reach court), and with sample E668 where there was a complaint of the presence of glass, the "glass" proved to be emulsifying salts of the nature of disodium hydrogen phosphate.

One fruit yoghurt sample was found to contain the preservative benzoic acid. and a sample described as Smetana, which ought to be Soured Cream, was found to contain only 9.2 per cent of fat and it was more like a yoghurt product. The N.I.R.D. seems to expect 'Smetana' to

contain 36 per cent of fat, but it is a product used by people interested in Russian Cooking recipes, and there are several statements in the literature to the effect that Yoghurt can be used as a substitute for it. The laboratory suggested that the fat content be raised to 12 per cent and that the words Half-cream be added to the label.

The only comments made about ice cream in 1972 were either related to labelling or to contamination, and with Dried Skimmed Milk, it was gratifying to find that the long argument mentioned in previous reports about "Instant Non Fat Milk" had at last died out, and that cans were being labelled: "Instant Dried Skimmed Milk" and with the statutory markings. Three cans with the old label were submitted, but the matter was no longer considered to be of further importance.

The misleading nature of the labels on cans of "Skimmed Milk with Non-milk-fat Powder" has already been mentioned in the section on labelling.

In the field of frozen desserts of the mousse type, there were three samples commented upon, but one was a matter of labelling technicalities (size of lettering and list of ingredients) one was criticised because of mould growth, and one contained part of a roller bearing.

OTHER FATTY FOODS

Only fifty-eight samples of Other Fatty Foods were examined in 1972 under the Food and Drugs Act, but attention ought also to be drawn to the sample M384, which was cooking fat from a restaurant, labelled "Imported from Rumania Pure Pork Lard". It had been submitted in connection with a complaint about a restaurant meal (sample number 397) in which the cooking fat had been found to be rancid. The lard itself was not rancid, but it had an advanced Peroxide Value, and was obviously material with which few liberties could be taken. Among the Miscellaneous samples of 1972 there was also a sample of Olive Oil, sample M572, submitted from an inland Container Depot, under the Imported Food Regulations, 1968. That sample was perfectly satisfactory.

Comments on the fatty components of certain bakery adjuncts which were examined under the numbers M181, M163 to M172, M217 and M408 will be found in the Miscellaneous section of the report.

The year began with what looked like a start to all-out war between the Dairy Industry and the Margarine Industry when the journals FOOD MANUFACTURE (March, 1972, page 8) and PHARMACEUTICAL JOURNAL (April, 1972, page 289) seemed to be reporting the opening skirmishes, with one side suggesting that within ten years, butter, milk and eggs may have to carry a government health warning, and that already in the United States of America there is a recommendation that foods which contain quantities of fat in excess of ten per cent should state the fatty acid spectrum of the fats present; and the other side saying that the unsaturated fatty acid, linoleic acid (a C₁₈ unsaturated acid which is a major component

of poly unsaturated margarine) may present a health hazard. Later in the year the ground had shifted slightly and it was Erucic acid, an unsaturated C_{22} acid which was likely to be harmful. The laboratory had discovered that there were two brands of margarine which used a large proportion of oils which contained Erucic acid, and samples M813 to M816 inclusive showed that it was occurring in quantities up to 20 per cent of the fatty acids present. Some of this fatty acid comes from rapeseed oil and some comes from fish oils. At first the laboratory was a little put off by a much used book, "Laboratory Handbook of Oil and Fat Analysis" (Cocks and Van Rede), whose table on page 408 showing fish oil analyses, is in error—or at least, the data in "The Chemical Constitution of Natural Fats" (Hilditch and Williams), page 47 is more complete . . . but rapeseed oil and fish oils used together in margarines can give a high C_{22} unsaturated acid component.

Only three fatty foods were given adverse statutory certificates in 1972, all three being margarine samples. These were samples M533 and M534, and sample 8942, all three of which were severely affected by mould growth.

It was also noted during the year that a new material, sucrose diacetate hexa isobutyrate, had been proposed as an alternative to Brominated Vegetable Oil for keeping fruit debris in suspension in soft drinks. A method of analysis is given in J.A.O.A.C. but the laboratory was unable to obtain a specimen of the material for experimental purposes.

SUGAR, STARCH AND OTHER CARBOHYDRATE FOODS

The word "Carbohydrate" is a composite of the word "Carbon" and "Hydrate" (meaning water), so that carbohydrates usually have a general formula which is some multiple of $C.H_2O$. Carbohydrates include all the sugars, together with materials like dextrans, pectins, starch and cellulose. Other materials tend to be included with carbohydrates; vitamin C for example, and the relatively newly discovered "Nitrogen sugars" in which instead of there being a ring structure involving five carbon atoms and an oxygen atom, either the ring oxygen atom is replaced by nitrogen, or the OH group outside the ring has become an NH_2 group. Such nitrogenous sugar materials include Chitin, the material from which insect bodies and lobster shells are made, and it is so durable that it resists geological time. All human body joint, eye, and internal lubricants are made of carbohydrate, so that carbohydrate utilisation may be involved in the rheumatic diseases, and it can be said that more than half the organic matter in the human body is carbohydrate . . . So when an amorous American refers to his lady as "Sugar" or "Honey" he is about sixty per cent accurate. This is a thought to cling to when anybody of medium height and fourteen stones weight is faced with a suggestion that he should follow a carbohydrate-free diet. It is probably not coincidence that young creatures in particular have such an appetite for sugars. Carbohydrates are an important article of diet, and although Professor John Yudkin continued his campaign against sugar in 1972, by publishing a book, "Pure, White and Deadly", it may eventually be discovered that though it may poison us, we may not be able to live without it. The British Nutrition Foundation

in Bulletin No. 7 stated that many of the diseases peculiar to Western civilised man may be due to a lack of fibre in the diet, and that too is carbohydrate.

Approximately one thousand samples of carbohydrate foods were examined by County Laboratory in 1972. One has to use the word "Approximately" because there are difficulties of classification, problems of overlap (after all—one could say that milk is carbohydrate food in view of the fact that about a third of its solid matter consists of carbohydrate. Oranges are all carbohydrate, and materials like coconut are composed of a poly-mannose sugar molecule which almost defies classification, so that on the basis of a chemical classification one hardly knows where one should stop) and the problems of filing (which make so many people regret that computers were ever invented) add another area of doubt to these statistics. All filing is as good as the person who files, whether the system is to throw everything into one box, or hide it all in a computer's tapes. A great deal of food could be classified as 'Carbohydrate'.

Of this estimated total, two hundred and fifty-six samples caused comment of one kind or another in 1972, but twenty-eight of those comments were to do with labelling, eighty-six were to do with foreign materials, (most of the samples which contained foreign bodies having been submitted by complaining members of the public), forty contained insect remains, and seventeen were affected by mould growth. Statutory certificates were issued in connection with fifty of those samples, which means that although the fifty did not find their way into court, the circumstances were such that they would probably all have resulted in convictions if they had reached court.

The more interesting items among the remaining carbohydrate foods are the following:—

- | | |
|--------------|---|
| Sample 8861 | Demerara Sugar. This complaint sample was submitted in two portions. First, some of the sugar itself, and Second, a portion of a breakfast cereal meal in which it had been used. Both portions contained insoluble matter consisting of calcium phosphate (together with a little rust). The phosphate may have been a clarifying powder, and it was suggested that the manufacturer might care to comment upon it. If he did, then the laboratory's ears were considered too delicate to hear what he said. |
| Sample C2403 | Cinnamon Sugar. This sugar had been flavoured with a bark which was not cinnamon but was cassia powder. The manufacturer stated that cassia bark was always used in cinnamon sugar! |
| Sample S3056 | Granulated Sugar. The palate is not a very good measuring instrument for "sweetness". This sample was a complaint sample in which it was alleged that it had been contaminated with saccharin. The sample was, however, a perfectly pure sample of granulated sugar. |

- Sample S8644 This sample probably represents a defence of the adequacy of the palate. It was a sample of sugar said to be contaminated with oil. The two pound bag did contain a small amount of lubricating oil. The amount was only 4 milligrams (or something like 0.0005 per cent) yet somebody had been able to taste it.
- Samples E9382 and C1775 were complaint samples of sweets. The first was a chewy form of toffee which had been made unsightly and granular to the bite, by having acquired a small quantity of burnt sugar carbon. The chocolate sample which bore the second number was similarly made unpleasant to eat by the presence of small accumulations of cocoa shell. These were very finely ground, but they had formed themselves into small dry balls.
- Sample S8646 was a sample of Lemonade which was said to have caused vomiting. All that was amiss was that the liquid was totally deficient of all additives except carbon dioxide, so that it was 'pure' carbonated water. Sample 2284 was another such mineral water, but in that case nobody was made ill by the taste of water.
- Samples S9599 to S9604 and S9661 and S9662 were a whole series of soft drinks in which the deposit which occurred in them consisted of the water organism *Asterionella*. The manufacturer decided, when the second pair of samples showed the same defect, that he would install new equipment.
- Samples 919 to 921 inclusive, were samples of soft drinks which were being dispensed through metal pourers. Further information on the subject may be found in the miscellaneous section of the report. Whereas potable spirits made little attack upon such metal pourers, it was found that the slightly acid soft drinks tended to corrode such pourers quite severely.
- Samples 1638 and C2/72 were samples of grapefruit juice and grapefruit in syrup respectively, in which the cans had been attacked, and excesses of dissolved tin were in the liquids. Stock was withdrawn in each case. Sample 288 was canned orange juice in which the attack had been less severe, and follow-up cans from the same stock showed that most of the consignment contained less tin than the recommended limit. This juice was allowed to be sold quickly at reduced price.
- Sample 5/72 was an Informal sample of Grapefruit Juice submitted by an outside authority in March, which contained about two thirds the recommended maximum amount of tin, but it also proved not to be Grapefruit juice but a

grapefruit *drink* containing only 7 per cent of juice. The laboratory never takes enthusiastically to the inspection service setting itself up to do consultants' work, and this is a major factor in its preference for the retention of Food and Drugs inspection by a County Inspector. In October, sample N9209 was submitted informally by the County. It was the same brand. It was still labelled 'Grapefruit Juice', and the tin content had increased. A formal sample was taken within a fortnight, and at the prosecution it was stated that the distributor worked single-handed but that he always co-operated with the local authority, and had previously sent some of the product to that authority to be analysed. He said that he was taking the Public Health Inspector's advice about having the product relabelled, but that he had not known that the product was unsatisfactory since it had been bought in Greece on his behalf by an agent. The magistrates imposed a fine of £25 with £13 costs, but they seemed not to realise that the rate at which the product had started to act upon the tins did not leave time for a large re-call and re-labelling operation.

Further Grapefruit examinations made in 1972 underlined how unsatisfactory the public's understanding of this product can be. For example M839 was submitted early in the year because the product had a 'smell'. The smell was the odour typical of juice stored in the opened can, and the Vitamin C content was only of the order of 2 milligrams per fluid ounce. When there are no claims about Vitamin C, it is on the cards that none is in a product . . . but in this case the level of tin present and the odour of storage in contact with metal, made it seem likely that the original pack may have been rather better than the sample suggested. The question was followed up in September with sample 393, when it was found that the Vitamin C content of the freshly opened pack was 10.5 mgms. per fluid ounce. If the juice had been stored again in the opened can, however, it would quickly have fallen to the levels previously found. Samples C2412 and C2413 were also canned Grapefruit samples about which there were complaints. These were said to have made people sick. When, however, the laboratory failed to find any toxic material, the remainder of the samples was fed to animals at the Pathology Laboratories. The animals came to no harm.

Samples 19 and E38 were samples of Rose Hip Syrup which had aged to the deterioration of their vitamin contents. In each case only about half of the declared amounts of vitamin C were present.

Samples 8906 and 8907 indicate how even the laboratory can sometimes wonder whether it has done exactly as it should do. These samples were more samples of canned Grapefruit Juice. The first sample was a complaint about paraffin taste, and in the contents of the opened can there was hydrocarbon oil resembling Derv, to a level of 14 parts per million. The one number 8907 represented a whole series of follow up cans. No Derv was in most of them, but 3 parts per million were found in one, and 0·3 parts were found in another. In retrospect it could not be decided whether the outsides of the cans had all been cleaned before opening . . . and it was suspected that all the Derv which had been found may originally have been splashed on the outsides of the cans. In this age of Consumer complaints about hygiene, one wonders how many people do clean the outsides of cans before allowing the can lids to dip down into the liquid contents . . . Probably very few! One other can from Grapefruit, sample number 74, was submitted almost empty, but with a few crystals adhering to the sides. These were specimens of the natural grapefruit glycoside, Naringin, which sometimes crystallises out from canned grapefruit. No-one seems certain about why it happens, but it is sometimes said to be associated with the use of immature fruit.

Samples 201 and 202 were cans of fruit salad which were found to contain only 43 per cent and 42 per cent of fruit respectively. There is a code of practice which requires 54 per cent of fruit in cans of the size involved, so the Weights and Measures inspectors were informed.

Sample 1667 and M335 were good examples of what the "natural" food advocates may encounter when they speak of 'Pure' food. Both samples involved Honey, (plate 24 illustrates the first, which was black in colour) but the second was a sample not only of honey but of Propolis.

The first proved to be a mixture of nectar honey and Honeydew honey. There are methods for the determination of honeydew honey, one being referred to in Analyst 1960 p.412, and another, which deals with the determination of colloids, in Analyst 1954 p.435. The colloid content of honeydew is usually higher than in honey. Honeydew is the sweet and sticky excretion of certain leaf sucking insects, and when honeydew is collected within the boundaries of a busy town the bees sometimes pick up the soot and atmospheric pollution to be found on the leaves of the trees which grow near traffic. The bees in this case had been foraging in Southport, which is a town with a good atmospheric

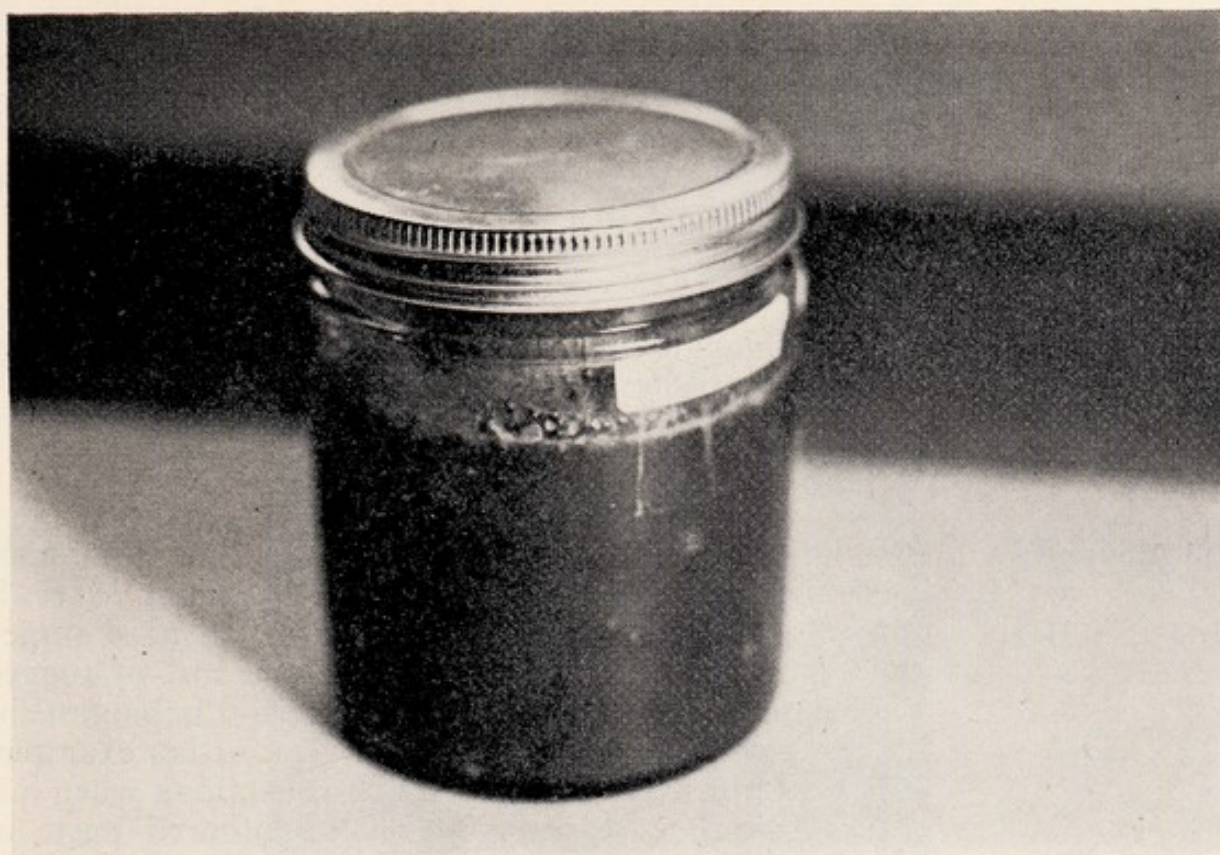


PLATE 24 Black Honey

pollution record, but not even in Southport does one see the three months crown of red colour which made our forebears bring Plane trees back from Africa to England so presumably even there the traffic kicks up its share of atmospheric pollution. The black component was too finely divided to be identified by microscopic examination.

Propolis is the material with which bees seal off their honey comb. It is usually made from natural resins which the bees remove from trees by means of their mandibles, and they carry it on their back legs. Normally they mix it with wax. It is not unknown for the virtuous bee to take road-tar however, and on this particular occasion they must have been taking newly applied lead paint, because the propolis contained over nine per cent of lead, in the form of red lead. No lead had been transferred to the honey however.

Samples 094 and 1762 paralleled a problem which was mentioned on p.147 of the report for 1970. Then it concerned the sale of a honey-like product under the confusing name, "Honey Bear Spread", where Honey Bear was said to be a trade mark. Trade marks, however, are a means only of identifying manufacturers, not products, and the Ministry itself has given an opinion since then, that trade marks cannot take the place of the designation of

a food, and in any case they may not be used to give a misleading impression. Both samples whose numbers are quoted now, were materials of a similar kind, namely artificial honey labelled "SUNNY SPREAD". In this case, however, despite the antiquity of the name, the firm agreed to add an "appropriate designation".

Sample C2341 was a complaint sample of sultanas, but the unpleasant looking inclusion found with them consisted only of a pulp of sultana fragments and sand.

Sample 3/49 similarly, looked unpleasant, being a lump of indescribable material found in a treacle Parkin cake. It proved however only to have been a ball of skimmed milk powder which had retained some sort of rugged independence throughout the mixing and baking of the cake. Samples S8987 and UDC 1 were further examples of how unpleasant some food debris can look when it is found. In those cases it was a discoloured paste of potato crisp particles and edible fat . . . the second specimen of it containing oil which was quite rancid. One complainant who brought some of this material from his bag of crisps to the laboratory, was so cross about it, that he insisted upon paying the analysis fee and being issued with his own certificate of analysis, so that he could conduct a prosecution himself. In the event there was no prosecution.

Samples C1735 and N5175 and 1/72 all showed deterioration effects. The first was cake which had a soapy flavour, but it was found to contain fat which was somewhat rancid, and the liberated fatty acids had reacted with sodium bicarbonate in the raising agents to produce a soapy flavour. Samples N5175 and 1/72 were, respectively, a Chocolate Dessert Mix and a Can of Peas, both packed in packaging which was not hermetically sealed. The former had a laminate pack and the latter a can—and the latter was very difficult indeed to establish as a faulty can but the fault was eventually found. Plate 25 however, shows a novelty pack of sweets in which, near the fingerboard of the instrument, some readers' sharp eyes may be able to distinguish a cockroach nymph. At first there appeared to be two wrappings, but on close inspection it was found that neither was sealed, so the insect could have got in at any place of storage. It is probable that only those faulty packs which are difficult to detect get out into the distribution chains,



PLATE 25 Guitar and Sweets

so such occurrences need not necessarily indicate carelessness.

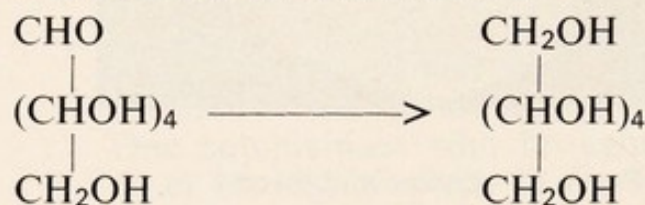
Sample S9040 was also said to contain a cockroach. It was self raising flour which had been found to contain a dried brown object when a housewife was at work with it in her kitchen. That 'cockroach' proved to be a piece of onion skin.

Sample 8835 was a sample of cake which showed considerable rodent damage without actually having any rodent droppings associated with it. The characteristic rodent tooth marks on the wrapping paper and components of the cake were very plain to see.

As may have been noticed, most of the items in this section concerned complaints made about things which sometimes seemed like foreign material but which actually proved to be a little different from what had been expected. There is, of course, a separate part of the report which deals with extraneous material in food. This section should probably include mention of sample 2283, Fruit tarts, which were found to be contaminated with white spirit, however, and sample 70/72 which was an example of flour in which the compulsorily added vitamins had not been mixed in evenly. A further example was encountered in 1972, of the flavour described

as 'oil' occurring in carrots. An example of it was mentioned on page 222 of the 1971 Report. Again, with samples 83 and 84 which were examined in 1972, the phenomenon appeared to be associated with the occurrence of natural constituents in carrot, occurring in greater quantity than usual. It is, however, very difficult to be sure that what we see is not a contaminating material which is occurring only at low levels in those carrots which are free from taste! Sample 12379 provided another example of this kind of dilemma. It was a canned vegetable concentrate in which a large proportion of spinach had been used. The content of nitrates was 72 parts per million, and, in view of the concern created a year or two ago over the incidence of high levels of nitrates in baby foods which contained spinach, it is probable that once again we are seeing that unexpected capacity of spinach to retain fertiliser nitrogen. There was no reason to suppose that anybody would feed the material in large quantities to babies, so no alarm was raised.

Finally, mention might be made of one slightly unsatisfactory situation which occurs with some carbohydrate foods. Vitamin C has become an extremely valuable article of commerce and it is usually synthesised from glucose. The first step is reduction of the glucose from its aldehyde structure to an alcohol structure:



This hexahydric alcohol is Sorbitol, and being a relatively cheap item already in production, it is used a great deal as the sweetening agent in diabetic preserves. One would not have thought it the best alternative for a diabetic, since the material which a diabetic cannot handle is glucose, and one would have expected Sorbitol to change back to glucose in metabolic processes. It certainly is digested, and it therefore will contribute to a person's calorie intake . . . yet very often one finds that labels on diabetic foods recommend them also for slimming diets. It underlines the peculiar fact that any food may be offered as slimming food, provided that there is a statement of calorie content and a warning that the food cannot aid slimming except as part of a calorie controlled diet. Sample C1240 however, was a sample of Diabetic Apricot Preserve which had been examined in 1971, and which had been unique in that the sum of the identifiable constituents found in an analysis did not account for the whole of the total solids content of the preserve. The laboratory suspected that the sorbitol which had been used might have been converted straight through from starch, leaving some molecules of unusual size in the syrups obtained. The laboratory chose to call the difference "Pectins" although Pectins are more commonly related to the sugar Galactose than glucose (although a comparable hexuronic acid of glucose matching the hexuronic acid of galactose which occurs in pectins exists) and the unidentified component was probably a dextrin.

Representations made to the manufacturer led to his investigating his supplies of sorbitol syrup, and after he had satisfied himself that the

matter had been remedied he sent four specimens of his preserves, samples M952, 3, 4 and 5 for the laboratory to perform further analyses upon. These analyses were more normal, and once again about 96 per cent of the solid matter could be accounted for in terms of sorbitol. In the 'peculiar' sample only 75 per cent of the solid matter had been sorbitol.

MEAT PRODUCTS

Entry into the Common Market has posed many problems, but one which is seldom mentioned is a question of agreement about meat analysis. Almost all meat analysis has been based upon the assumption that meat consists of fat plus lean, and that lean consists of protein plus water. In Britain the commonest method of dealing with the problems of meat analysis has been to determine the nitrogen content as a measure of the protein, and to express as percentage lean meat a figure which has really been a ratio of the nitrogen found to the amount of nitrogen in the meat sought. The "Scientific and Technical Survey No. 69" of the meat and fish research organisation at Leatherhead showed that there was very wide variation in the nitrogen content of meat, but in Britain a series of agreed factors had already been adopted.

On the Continent a great deal of the meat analysis is carried out on the basis of a figure called the Feder Number, which is the ratio of water to solids-other-than-fat in meat. The Germans have improved upon this by using the ratio of water to protein. If, however, the various methods are brought to the same base line, we find that the German and Netherlands calculations assume that lean meat contains about two per cent more water than is assumed in Britain.

The Common Market Countries seem much more anxious than Britain has been to base all food standards upon analytical data, so the fact that the wetter offals (when used in meat products) can originally contain only half the nitrogen found in the better cuts of meat, and the fact that manufacturers have very good arguments in favour of using such materials, and for using non-meat flesh-derived nitrogen materials such as blood plasma, etc., in such products, do probably mean that some rather overdue research into meat analysis must soon take place. The problem is aggravated by the use of milk powder and protein, bean protein, soya products, sodium nitrate and monosodium glutamate . . . all of which contain nitrogen and spoil the water to protein ratios. Kesp is the latest worry among such nitrogenous additives.

Better methods for deciding where the nitrogen in meat products comes from are required, and one of the very few papers on deciding what kinds of meat are in use was published in 1972 in JAOAC (May) page 458. Even now the method only claims to differentiate uncooked meats. The methods are slow and they represent one more argument against the present system of pretending that analyses can be done on the basis of a "fee per sample". One more public analyst's laboratory closed in 1972 as a result of the realisation that this concept had so undermined the business that it was making only a three per cent return on the capital invested.

The meat products which were examined and criticised in County laboratory during the year 1972 are discussed under headings arranged in order of increasing departure from the natural product.

Fresh Uncooked Meat

Forty-eight samples of uncooked meat were examined, of which eight were samples of liver.

Probably one of the most interesting of these uncooked meats was a specimen of deep frozen shoulder pork which had a very pronounced "pork sweetness" about its odour. The smell was very fugitive but it was most pronounced in the unsaponifiable matter of the fat. Boar meat is known to have an unpleasant, urine-like odour on some occasions, but this smell was almost musk-like. The Meat Research Institute at Churchill gave an opinion, however, that this sweet odour probably was boar taint in a very young animal. The fact that it remained in the unsaponifiable matter was considered significant, and a means of emphasising the odour was recommended. This was lightly to heat the surface fat on the joint with the hot heating element part of a small soldering iron (which does not get as hot as the point). An emphasis of the sweet smell by this procedure was said to be very characteristic of immature boar taint. In the course of the discussion it was also said that some growth promoters also promote a faecal odour in pig meat.

There were eight samples of minced meat examined. Those which contained sulphite preservative have already been mentioned in the Preservatives part of the report. Two more were just beginning to putrefy (and another had a dead bluebottle associated with it). One of the samples which contained preservative was examined as a result of a complaint (sample S9787). It was being sold as "Minced Beef" but it contained beef, mutton and pork. The uncooked follow-up sample S9786 was found to have fat almost exactly like that in the complaint sample, (the $C_{16:0}$ acids were low for beef while the $C_{18:2}$ acids were too high for beef or for mutton), and precipitin tests confirmed the composition to be Beef 40%, Mutton 40% and Pork 20%. It also contained 800 parts per million of sulphite preservative. This sample was not taken to court for some reason. Sample C2387 was an informal sample of "Minced Beef" which was also found to contain pork and mutton. Three of the samples of liver were found to contain quantities of copper at the levels of 60 ppm., 130 ppm. and 147 ppm. Only one liver sample contained a significant amount of lead, the amount being 3.4 ppm. One sample, N4744 consisted of pieces from seven pigs' livers which were thought likely to contain large amounts of iodine following medication with iodine compounds, but the amounts found were trivial, and in any case the liver did not seem to be the correct organ in which to seek iodine deposits.

Cured Meat

There were only six samples of bacon and ham examined during 1972, and only one of those, complaint sample 526, was of special interest. It was said to look peculiar and to have caused sickness, but its only

peculiarity was that the surfaces of the ham showed a greenish iridescence—an optical effect caused by the spacing between the bundles of muscle fibres. It is not a particularly unusual feature in cured meats.

Cooked Meats

Fifteen specimens of cooked meat were examined, but those on which comment was made were complaint samples which were none of them straightforward. Thus sample 1661 was a piece of roast beef sent with a cryptic note 'Complaint—colour and smell'. It must have been at least a week since it had been roasted and it had the unprepossessing appearance of meat which had been roasted and retained. It had a dry appearance, but there was no rancidity and no abnormality of odour. The volatile nitrogen content was acceptable, and no-one could understand why it had been submitted. Sample 1691 similarly was most of a boiled ham. It had a slight musty odour suggestive of its having been boiled in a cloth, but nothing obvious was amiss, so it was sent to the A.R.C. Food Research Institute for a second opinion. That opinion was that there was nothing wrong with it. When sample S9763 was submitted, the laboratory had to agree that for 'steak' it contained an enormous amount of gristle. There was 59 per cent present. It transpired, however, that the complainant had carefully cut out all the gristle and had sent only that. So the only complaints with some substance to them were trivial. One was a piece of ham having a blemish caused probably by an injury. A small amount of sand was trapped in it. The other was cooked tongue which had not been skinned properly, and it still had some of the epithelium upon it.

Canned Meat

Most of the comment made against canned meat arose from complaints, and most was to do with "foreign matter". Items such as congealed blood, blood vessels, and even, in one instance, a small piece of liver were involved, but iron staining, and fragments of hairy bovine hide were also encountered. In one instance the mould which had grown on some corned beef must have grown after the can had been opened. There had been said to have been some New Zealand and some French corned beef in some parts of the country, which were poor in meat, so quite a number of the corned beef samples which were submitted were purchased to check that none of the poor quality product was in Lancashire. The lowest meat contents found occurred in an Australian corned beef (sample 8838) and in another Australian product called Corned Beef Loaf (sample 8839), but both complied with regulations—the former having a meat content of 99 per cent and the latter having a meat content of 80 per cent.

Canned meats of the 90 per cent standard were, on the whole, satisfactory, although there did occur one instance of Pork Luncheon Meat (standard not less than 80 per cent meat) having been sold as Chopped Pork and Ham (standard 90 per cent meat).

Canned Ham

Regulation 3(1)e of the Canned Meat Product Regulations 1967 exempts from the general provisions of the regulations, any canned cured

ham to which nothing has been added but gelatine, and which bears a label saying: 'Ham in Natural Juices', or 'Ham in Natural Juices—Gelatine added'. Usually, canned hams are reasonably satisfactory, but in three instances the laboratory had to report rather low meat contents. These were 87 per cent, 77 per cent and 72 per cent respectively. On the other hand, one found unexpected food value in odd places. Sample N5376 deferred to the new tastes of the Common Market, inasmuch as it consisted of canned French Fried Pork Rinds. The sample contained only one per cent of moisture, with 74 per cent of protein and 25 per cent of pork fat. A sample of canned Parmesan Tripe did not do quite as well. That contained only 60 per cent of meat.

Meat with Cereal

Thirty-two samples of "burgers" and "Steakettes" were examined, but only five deserved comment, and only one of those because of low meat content. The firm was very surprised to hear of a pack which contained as little as 75 per cent of meat and went to great lengths to reassure the authority that it must have been an isolated case. There was an inevitable occurrence of inclusion of hairy hide in another sample, and as with two instances each involving the presence of a fly, it did not appear to have been a manufacturing fault. A fragment of wire which was submitted with the last sample to have received comment had been removed from the food before being brought to the laboratory and nothing much could be decided about it.

Canned Meat with Gravy

This product has improved with the passage of time. The illustration in the section on Labelling shows that it is still possible to be disappointed on opening a can of this product, but it almost always now contains 75 per cent of meat. Only with one sample, sample 12331, was the meat content found to be as little as 70 per cent. There were two samples in which bovine hair attached to small pieces of hide appeared, but one other complaint arose because of failure to trim out a small secretory organ from the meat used.

Ready Meals

The early problems which arose over the use of the words 'Ready Meal', in order to indicate to an intending purchaser that Meat with gravy, Meat with sauce, Meat with Cereal, and Meat with Vegetables were not made to the recognised standards, seem largely to have been overcome. Just one canned meat product was encountered which should have borne the words 'Ready Meal', and that was called "Beef Casserole". It contained only 23 per cent of meat, but it proved to be old stock. Another authority notified Lancashire that some 'snack meals' being made in the area were not of the required meat contents, but a representative collection of the products from local shops were all found to comply with the regulations.

Potted Meat

This name must imply the presence of 95 per cent of meat, but there were five samples which did not contain so much. One of these, from an

autonomous authority, was found to contain only 49·5 per cent of meat, and it failed to result in a fine for the vendor only because the Food and Drugs Act is a little more than the casual tangler with it bargains for. In this case the copy of a certificate of analysis was not sent to the defendant as is required by Section 198. The inspector (bless his heart) drew the solicitor's attention to the omission, but the solicitor sent the copy, afterwards, not to the defendant but to the defendant's solicitor. The magistrate's clerk, at the hearing, said that this is not what the Act requires, and he ordered the case to be withdrawn. Permission was requested to withdraw and re-serve the information, but the Clerk ruled that withdrawal included withdrawal of the Information, and that consequently the matter had progressed beyond the time limits laid down in the Act.

Meat paste is not required to contain as much meat as is required in potted meat, and of thirty-nine samples of meat paste examined, only two caused comment. Both were Continental imports. One contained only 65 per cent of meat instead of the necessary 70 per cent, and the other was labelled only in French, and did not therefore bear an appropriate designation which would convey to an intending purchaser the true nature of the food.

Sausages

One hundred and thirty-seven samples of sausages were analysed in 1972, the varieties being, sixty-nine of Pork, thirty-six of Beef, twelve of a new hybrid called Pork and Beef, seven Black Puddings, five Continental (high meat) sausages, three Liver sausages, one "Ulster Fry" and one Sausage Savoury. What, for classification purposes, is described here as a 'Sausage Savoury', was in fact sold as Sausage Egg and Onion Croquettes". Complex calculations indicated that it just achieved the standard for croquettes laid down in the Sausage and Other Meat Product Regulations, 1967, regulation 5 (1)(i), with seven per cent egg and twenty-eight per cent meat. Even so it was rather a poor thing. A high proportion (twenty of the pork sausage samples and fourteen of the beef) received adverse reports for containing undeclared preservative. Seventeen of the total number were marginally short of meat—usually lean meat—but in most of those cases it did appear as if the manufacturers had hoped that by boosting the filler nitrogen with soya the shortages of lean meat would pass unnoticed. Only one sample, skinless prepacked sausages at that, was seriously deficient of meat, containing only forty-six per cent instead of the prescribed sixty-five per cent . . . but the formal follow up sample was just about able to count as being genuine. There were eight statutory certificates issued, but only two of them were actually taken to court—one for a piece of Elstoplast in a sausage, and one for a cartridge case in a black pudding. Somehow those issued for mould, rodent droppings and a cigarette filter tip failed to reach court, as did one issued for meat deficiency and iron staining, (again, it contained a large proportion of soya) and two more issued for undeclared sulphite preservative.

If 'average' values have any meaning in a situation like the random sampling of sausages, then the average meat content of pork sausages in 1972 was 69·5 per cent, the average meat content of beef sausages was

59 per cent and the sausages called "Pork and Beef" seemed to have acquired that name simply because more meat other than pork had been used in their making than the standard prescribes. The total meat content in these sausages averaged out at 66·5 per cent. One sample of sausages, sample number 107, was submitted with a complaint that they contained too much gristle. In fact there was only 2½ per cent of gristle present—about half that found in many Beefburgers. What was unusual was the high content of lean meat, which was fifty-five per cent (the total meat content being 73 per cent). Perhaps, in view of the grades of meat which are used in sausages, the manufacturers are right when they say that it is not everybody who likes a high meat content in sausages.

Meat Pies and Puddings

Under the general heading "Meat Pies", for which a minimum meat standard of twenty-five per cent meat exists, the laboratory examined forty-four meat pies, (and found an average meat content of 27·4 per cent.) and nine pork pies (and found an average meat content of 34·1 per cent.). The allowances made in these products for non-meat nitrogen is almost always an under-estimate, but there is sufficient margin in these figures to promote confidence that the general purpose of the regulations is being fulfilled. In only three instances were meat contents of less than 25 per cent. recorded, those being with samples 8827 (18% meat), 246 (18% meat) and 127/22 (19% meat). Ten statutory certificates were issued, nevertheless, but they were because of extraneous matter: wire, glass, mouse excrement, paper, insects and mould. Five of those resulted in fines, and the complainant in one authority which decided against prosecution declared that she would take the matter to court herself.

The average meat content of the twenty-six meat puddings examined was thirty-three per cent . . . and again, the standard requires at least twenty-five per cent meat. In puddings, however, there is often quite a large fat allowance to contribute toward the meat. Only four puddings caused comment, all being complaint samples, two containing hide, one a renal calculus, and one which had cigarette debris in its foil case, (suggesting that the case had been used as an ash tray). The background information, however, produced too many uncertainties for this case to go to court.

Meat and potato pies are only required to contain 12½ per cent of meat. It is almost misleading to state the average amount found in this category, however, because, although twenty-eight samples were examined there seemed to be no knowing which category of pie was really being offered. Thus, one pie, submitted as a 'Potato and Meat Pie', where, with the vegetable named first in the designation, there could be no insistence even upon the 12½ per cent meat standard, the actual meat content proved to be thirty per cent. If one disregards this one, the average meat content of Potato and Meat Pies proved to be 5·4 per cent. For what it is worth, the average for 'Meat and Potato Pies' worked out at fifteen per cent, but only because some 'Meat Pies' had been sold as 'Meat and Potato Pies', and thus balanced out eight 'Potato and Meat Pies' which had also been sold as 'Meat and Potato Pies'. Only two statutory certificates were issued

against Meat and Potato Pies, one because of iron wire present in the filling, and one because of a slug which had clearly been introduced with the potato ingredient. Neither was taken to court. Nine of the samples were received as consumers' complaints, and their grumbles proved, besides those mentioned above, to involve such additions as a piece of ligament, pieces of vein, connective tissue, a tuft of cow hair, and textile fibres.

Ten more pies which belonged to the same category as far as the standard was concerned, were submitted as 'Meat and Vegetable Pies'. These had an average meat content of twenty-four per cent. Two statutory certificates were issued among those, one for Elastoplast in the pie and one for a greenbottle fly in the pie. The first complainant co-operated with the local authority concerned, and achieved a fine of £25, but the second complainant did not, and the case did not reach court.

Cornish Pasties are technically "Meat and Potato Pies", and the average meat found in those in 1972 was fifteen per cent. A certificate was issued against one—but the objection was really a designation matter, the pasty being one which contained no meat, but it contained an equivalent amount of cheese without putting 'Cheese' into the name. There were one or two complaints about potato being in pies sold as 'Cheese Pies', but as the quantity of cheese present equalled the standard for meat in equivalent pies made with meat, the laboratory did not support the point of view that potato was an adulterant. One sample of Cornish Pasties submitted direct from a district in 1971 was beginning to putrefy at the time of sale. The case was not heard until June, 1972, and it resulted in a fine of £75 and £6 costs.

Nothing could be said against sausage rolls, which, because of their flaky pastry and the rules which apply about fat allowances, worked out to give an average meat content of 33 per cent.

The year opened entertainingly with an incident which one hopes may be a cheerful portent of the laboratory's power to survive the anxieties which currently beset it. Sample N4721 was a pie-filling sample containing stainless steel wire (presumably from a sieve). The case was arranged to be heard in the newly opened Preston Courthouse but nobody had said so. The Deputy Analyst duly appeared at the Sessions House, was sent by a policeman to Lawson Street, and from Lawson Street was directed back to Starkie Street. At Starkie Street he found himself the only County employee on the premises . . . the inspector was at a conference in London and the outside solicitor not appearing for the County had forgotten about the case! Fortunately a member of the County Clerk's Department, who had arrived in order to show a new entrant something of court procedure, walked in, and with the aid of the defending solicitor the case was presented with sufficient clarity for the defending solicitor to be able to comply with his instruction to plead "Guilty". Thus the laboratory's efforts were not wasted. There was a fine of £30 and three pounds were awarded toward the analyst's certificate.

Poultry Products

Almost all the commodities which are made with meat are also available with a poultry ingredient, so that the laboratory examined poultry, cooked poultry, canned poultry, poultry meals, poultry pastes and poultry pies. In addition a number of samples of eggs was also examined.

Samples C1777, 1778 and 1779 were frozen carcasses which chemically were in sound condition, and did not have any musty flavour when cooked—but since this is not the whole story with frozen poultry, one of the dressed birds was passed on to the Public Health Laboratory, which found *Salmonella* type organisms in the gizzards (which were separately wrapped in polythene bags and pushed inside the birds to make up their weight). Sample C1748 was a small joint of meat, going mouldy when received, which though alleged to be something other than chicken proved to be part of the pelvis and part of a femur from a chicken. Samples E9427, N4896, C1748, E454, E577 and N5625 all consisted of parts of chicken meals in which the meat was thought not to be chicken, but in each case it was. Sample S8941 was a cooked leg from a frozen chicken about which the complaint was that there was “something wrong with the meat”. Fluid blood from an internal blood vessel still gave phosphatase and catalase reactions, showing that that part had not been heated sufficiently even to pasteurise it—let alone cook it. Only one canned chicken product was criticised. This was sample N5570 which was chicken in sauce, but it was not properly labelled, and it only contained two-thirds of the required sixty per cent of meat. The sample proved to be old stock.

The eggs were all tested for pesticides and for metals, but nothing remarkable was noted.

Meat Substitutes

Five samples of meat substitutes were examined. Two were in packets, and those were satisfactory but for slight errors in the statements of ingredients. The three other samples were canned products which bore names which by no stretch of the imagination could be held to be (in the words of the regulations) designations sufficiently specific to indicate to an intending purchaser the true nature of the food. The illustrations they bore, moreover, might justifiably have been said to convey nothing, but the impression they gave was one of meat. Plate 26 illustrates, for example, a “Meatless Stew”—a name which tells what it is not rather than what it is. In addition, one of the samples had been in stock for so long that it contained tin over the accepted limit.

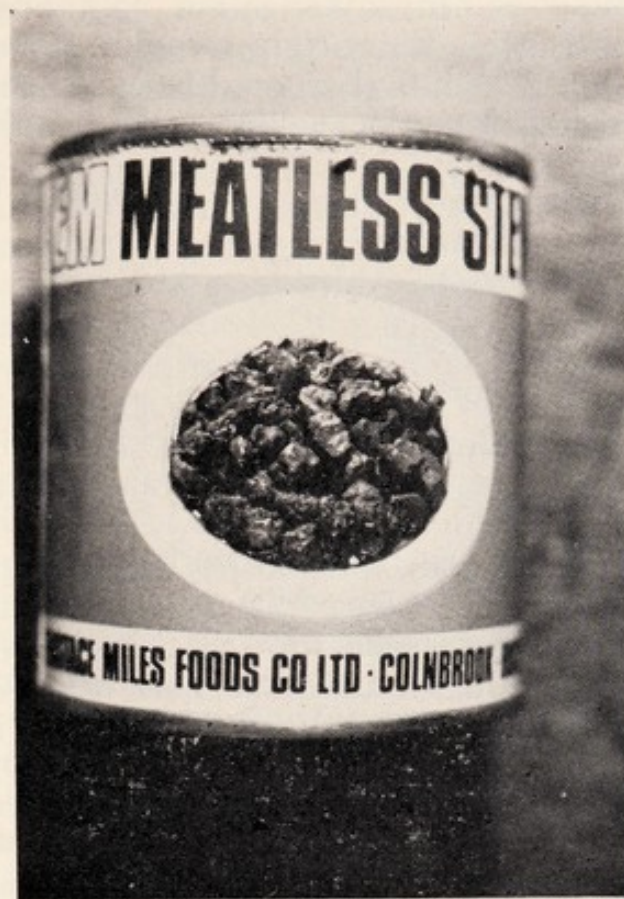


PLATE 26 Meatless Stew

FISH PRODUCTS

The County Laboratory, along with other Public Analyst's Laboratories, was asked to provide information about trace metals in fish during 1972, probably, ultimately, for the Ministry of Agriculture, Fisheries and Food Committee on Food Surveillance, and for the Ministry's Working Party on the Monitoring of Foodstuffs for Heavy Metals.

It proved to be horse's work to get fish samples to examine, partly, of course, because big business, in the form of supermarkets, has almost done away with the fishmonger . . . and there are not many shops where fresh fish can be purchased in the administrative county. If one were to judge by the response to the laboratory's request for shellfish samples, then one might conclude that it would not much matter whether Iceland put a fifty or a 5,000 mile limit on the protected areas for fishing around its coastline. The interest in the lead content of fish may be due to the fact that it is now known where most of the lead sent into the air by petrol engines goes. It dissolves in the surface waters of the sea. There is more lead in coastal surface water than in deep water. Unfortunately these are often the areas where the nutrients come up from the ocean depths to provide the grazing grounds of plankton on which the fish harvest depends.

The laboratory obtained most of its shell fish other than shrimps by going out and fetching them itself, but the number examined proved to be far too small to be of value in a survey. But it received a bonus in

the other fish samples it had for investigation, with those submitted under the Pesticides Scheme. Thus thirty-eight samples of fresh fish (or frozen fish) were examined, of which twelve could be called shellfish. The largest amounts of heavy metals found in shellfish were as follows:—

<i>Metal</i>	<i>Shellfish</i>	<i>Quantity (Parts per million)</i>
Lead	Shrimps	1.9
Copper	Portugese Oysters	90
Cadmium	Whelks	0.6
Zinc	Portugese Oysters	1020
Arsenic	Shrimps	3
Mercury	Shrimps	0.4

If one includes fresh crab and lobster then the crab contained the most cadmium, the amount being 2.5 parts per million, and lobster tail-meat contained the most arsenic with 2.0 parts per million. In a sample of Dressed Crab the cadmium found in the dark meat went up to as much as 4.9 parts per million. The high quantities of zinc and copper which occurred in Portugese Oysters compared with Native Oysters was pointed out to the Ministry, although even the Native Oysters contained 480 parts of zinc and 58 parts of copper. Scallops and Queenies were remarkable in that they contained no copper at all.

The highest quantity of mercury found in a fresh fish sample was in a sample of some objects called Ray Knobs. The amount of mercury was 0.29 part per million of which 0.22 part per million was organic. Ray Knobs were muscular tissue around a cartilaginous protruberance from the fish skeleton. A trace of gill was present on one, and a trace of skin was on another, and from these it was deduced that the Knobs originated somewhere around the mouthparts. In most fresh fish, however, the mercury content was very small. The highest amount found in ordinary whitefish was in a sample of cod. Even in that the level only reached 138 parts per thousand million. Two certificates were requested for accompanying consignments of frozen squid to Italy, where a limit of 0.7 part per million applies. The boxes examined contained no more than 0.1 part per million however. A statement of the mean mercury content of fish other than tuna was made on page 245 of Chemistry in Britain for June 1972.

Nitrites were not found in any samples of cured fish in 1972 although quantities of nitrates of the order of 10 to 16 parts per million were found in some kippers and in some specimens of smoked cod. None of these showed the presence of significant traces of nitrosamines. As mentioned in the Pesticides part of the report, Polychlorbiphenyls were found in all the samples of Herrings examined, the highest amount found being 340 parts per thousand million. Rather more of this material, but still of the same order, was found in some trout (sample M337) which had died in a river polluted with sewage effluent in the north of the laboratory's territory. There was not enough to poison the fish, but the material does appear to be widely distributed.

The metals content of canned fish was no more remarkable than that of fresh fish. The highest amount of cadmium found occurred in canned dressed crab, this being 1.1 parts per million. Cadmium also reached a fairly high level in a bottle of Mussels in Vinegar, in which 0.7 parts per million of cadmium were found. The highest amount of mercury found occurred in a can of tuna steak, in which it reached the level of 0.7 part per million. It is interesting to compare the difference one finds in the zinc contents of fresh oysters and of canned oysters. Normally canned oysters have zinc contents of only 200 to 250 parts per million, so that a level as high as 370 parts which occurred in one sample prompted the laboratory to ask for a follow-up sample. Laboratory records do show zinc contents of canned oysters going into the 500 parts per million range however . . . and, as indicated above, it would seem that Portuguese fresh oysters can contain much more zinc than that. One brand of canned crab meat packed in the Taiwan Republic of China drew attention to itself by having zinc contents in all the cans examined, which fell between 300 and 400 parts per million. Laboratory records showed very few samples which contained more zinc than the general limit for food of 50 parts per million, and none containing more than 75 parts per million. The literature mentions use of zinc salts in canned crab as a means of keeping the meat white, so the importer was contacted. There followed a great deal of correspondence, at the end of which the importer agreed to withdraw the product. It had become evident that the canners were not adding the zinc, and they claimed to be fishing in waters free from industrial contamination. It was said that they hoped that this finding might provide a clue to the presence of geological deposits of zinc ore.

In all, there were one hundred and eighteen samples of canned fish examined.

A question of contamination with mineral oil arose in the case of a complaint sample of boiled shrimps, sample 1663. The amount of mineral oil which was recovered after the unsaponifiable matter had been passed through a column of alumina, was 57 parts per million but the total hydrocarbons present (including the volatiles) was 170 parts per million. The laboratory does not possess enough information about non-tainted fish to be very sure about the amounts which might be considered to be acceptable, but some years ago it investigated oil taint in some mussels which had contained mineral-oil-from-alumina contents in the ranges 150 to 310 parts per million, and had then obtained mussels for comparison purposes which were said to be free from taint. Those free from taint had still had mineral oil contents of 30 to 70 parts per million, and there had been some people who thought they could detect a taste at 80 parts per million. In the blander flavoured shrimps therefore, it was considered to be just possible that 57 parts per million might have been significant.

Canned shrimps can give rise to breakdown products which react to chemical tests as if there is formaldehyde preservative present, but in recent times it has been unusual to find this happening, and the laboratory suspects that positive formaldehyde reactions may be an indication of developing staleness in the fish at the time of packing. Comment about

the finding of the equivalent of eight and a half parts per million formaldehyde brought the discovery that the shrimps had been packed in a tropical area in Pakistan. Quantities of formaldehyde-equivalent were found in open specimens of smoked cod which went as high as 26 parts per million. The age of the specimens was not known.

When one firm was contacted about fish fingers which contained only 56.5 per cent of fish, it replied that it had always prepared fish fingers with a fish content of 60 per cent, but that they were aware that this was an average figure. Perusal of the laboratory records confirmed that this was a very plausible reply, but individual samples, particularly of unnamed fish fingers sold loose in frozen food shops, reveal fish contents, which, in the worst cases, dipped as low as 51 per cent and 54 per cent. The average fish content of fish fingers examined in the laboratory in 1972 was sixty-one per cent. One sample, sample number S9812, contained an unsightly piece of skin, and another contained a parasitic cod worm (*Porracaecum decipiens*). A similar worm was also found in a sample of fish cake (sample S9351).

A series of samples of fish cakes sold in some fish and chip shops revealed a problem of labelling. The Food Standards Committee Report on the pre-1955 Compositional Orders, 1970, was concerned that the standard for the fish content of fish cakes had become outdated, and that fish cakes should now contain more fish. They further recommended, in paragraph 37, that fish cakes sold under any designation which included the word "Fish" should comply with the standard for fish cakes. This means, of course, that a product sold even with the name "Battered Fish Cakes" would still (under present circumstances) be required to contain 35 per cent of fish. The battered fish cakes in the series of samples taken to resolve a local problem, contained amounts of fish in the original fish cake which came only to about seven per cent, and in the whole item of food the fish content was only 3 per cent. The first move made by the friers was to call them "Fish Savouries", but when the recommendation mentioned above was pointed out, the name was changed simply to "Savouries". Now that the Labelling of Food Regulations are in operation not even this name will do, and at the moment the laboratory cannot see how anyone who makes the designation specific enough to indicate that fish is present will be able to avoid putting the proper amount of fish into fish cakes of this kind. Twenty samples of fish cakes were analysed, but the only other comment which occurred with the commodity was about an earwig which had managed to get itself associated with one of them.

One hundred and eighty-eight samples of fish products were analysed in total but very little else of any consequence was said against them. There were two minor labelling irregularities, an uncomfortably sharp piece of crab shell was found in some crab paste, some naturally separating "struvite" crystals were found in two tins of canned fish, one fish and chip meal had been fried in fat which was beginning to go rancid, a successful prosecution resulted when stale fish was found to have been used for the fried battered fish of a restaurant meal, and the Rainbow Trout served in a hotel meal was found to have its body cavity lined with a fungal growth (plate 27).



PLATE 27 Trout meal

SAMPLES CONTAINING EXTRANEEOUS MATTER

On page 1254 of *The Municipal and Public Services Journal* for 22nd September, 1972 it is reported that the Association of Public Health Inspectors had in its turn said that contamination of foodstuffs was 23 per cent worse than in the previous year . . . but the journal regretted that newspapers had devoted far more space to Lord Longford's allegations that our reading matter was getting dirtier than they had to the question of dirty food.

Such journalistic indifference may, however, be a healthy sigh of refusal to be stampeded. Anybody with any memory of the period in which Liza Minnelli's 'Cabaret' is set knows that food was handled less hygienically then. Cockroaches and fragments of debris in food were far more common, and nobody could then have borne the cruelly close scrutiny which was so devastating for the performers in 'Cabaret', and now picks out a few lapses in the manufacture of sterile solutions, the handling of smallpox cases, or the supply of unacceptable free gifts with food.

There is no doubt that the number of *complaints* about extraneous matter in food is increasing and that the Lancashire Laboratory hardly has staff enough adequately to investigate so many complaints. The investigation of 'complaint' samples is extravagant in terms of time and skill and changes the staffing needs and the cost basis of the laboratory.

The laboratory records show two hundred and two samples on which comment about extraneous matter was made, but there were also large

numbers of instances where the laboratory examinations failed to confirm that there had been any real justification for the qualms which people had felt. Examples of the latter would be Marmalade sample S177 in which hair was said to have been present, but the 'hair' proved to be fibrous tissue from orange rind; also in Marmalade, sample 8934, the alleged foreign matter complained of, proved to be pieces of citrus seed and carbonised sugar. Similarly the pieces of feather said to have been in chicken soup sample number E494 proved on close examination to be teased out pieces of meat-fibre. Samples M857 (porridge oats) and M104 (oatmeal) were represented by small black objects said to be mouse drippings—but both proved to be weed seeds, the latter almost certainly from Dock plant. Weed seeds were also present in sample E51 a sample of Hot-pot pie. Samples E8931, 2, 3, and 5 were samples of tea said to contain wood, but the wood proved to be tea stalk and was present in proportions of only 3.4 per cent, 3.9 per cent, 3.3 per cent and 2.2 per cent respectively. How much tea stalk one should be prepared to accept in tea has never been very certain, but the food analysis book by Pearson suggests that the author would be happy with anything up to 25 per cent.

The laboratory tends to feel impatient about samples like samples S456, 884 and S9304A which were all samples of bread which contained a vine fruit. On the other hand all rubbish is useful material in the wrong place, and perhaps a complainant is still right to object even when the thing about which he objects proves to have been edible. Sometimes edible material does not look very pleasant, as in the case of sample C1736, corned beef, said to contain foreign objects. What was actually present was a very small piece of tendon and six dark coloured pieces of meat which might have suffered slight iron staining, or might have dried out in blood before being canned. In the corned beef sample number N5753 the objectionable material was even less offensive. It proved to be a small piece of liver. Corned beef sample C1780 which seemed to contain unpleasant-looking black material, contained nothing worse than a deposit of coagulated blood. Sample Kirkby 2414 contained unpleasant looking pieces of blood vessel, and similarly in the Middleton sample 145 of Meat and Potato Pie, the unsavoury looking inclusion consisted of vein mixed with blood.

People complain about some unexpectedly ordinary things. Thus a sample of Sausage roll, sample 1664, was one in which the complainant objected to dark specks. All that could be recovered were 27 fragments of sage leaf. A "piece of plastic" found in Sample S9433, Spaghetti Bolonese, proved to be onion skin, and similarly fried onion skin which must have gained post-opening access to the bag of flour numbered S9040, and which caused a great deal of worry to the representative of a firm of flour millers when it was suggested that it was a cockroach, must have been introduced in the home of the complainant. Burnt onion was also responsible for a complaint about the presence of an alleged cockroach in the Chinese Restaurant meal of Prawn Curry submitted as sample E532.

The commodities most frequently involved with complaints about extraneous materials are bread, and flour confectionery. There were 42

samples of bread in which foreign material occurred. Thirteen of those contained dextrinised starch, bakery char, or dirty dough. The quantities are not always small. Thus sample 8858 which contained about an ounce of breadcrumb stained with fifty-five milligrams of iron oxide seemed to hold an inclusion so black that the complainant thought she had found a mouse in the loaf. The circumstances of its submission indicate that there is a lot to be said for members of the public having one office to which they might make all complaints. The sample came direct to the laboratory after a night porter who had taken a Saturday night complaint message by telephone had suggested that the specimen be posted in. The lab. contacted one of its inspectors, who found that it belonged to another inspectors' district. That one learned that the bread had been purchased in a nearby town, and the inspector for that town was not very pleased that the matter had not come to him in the first place. He then found it difficult to establish which bakery had been involved. When it looks strange that the tables show prosecutions in one place for offences dealt with in another place by cautionings, circumstances of this kind are sometimes responsible.

Prosecutions were taken over bread containing a cigarette (plate 28),

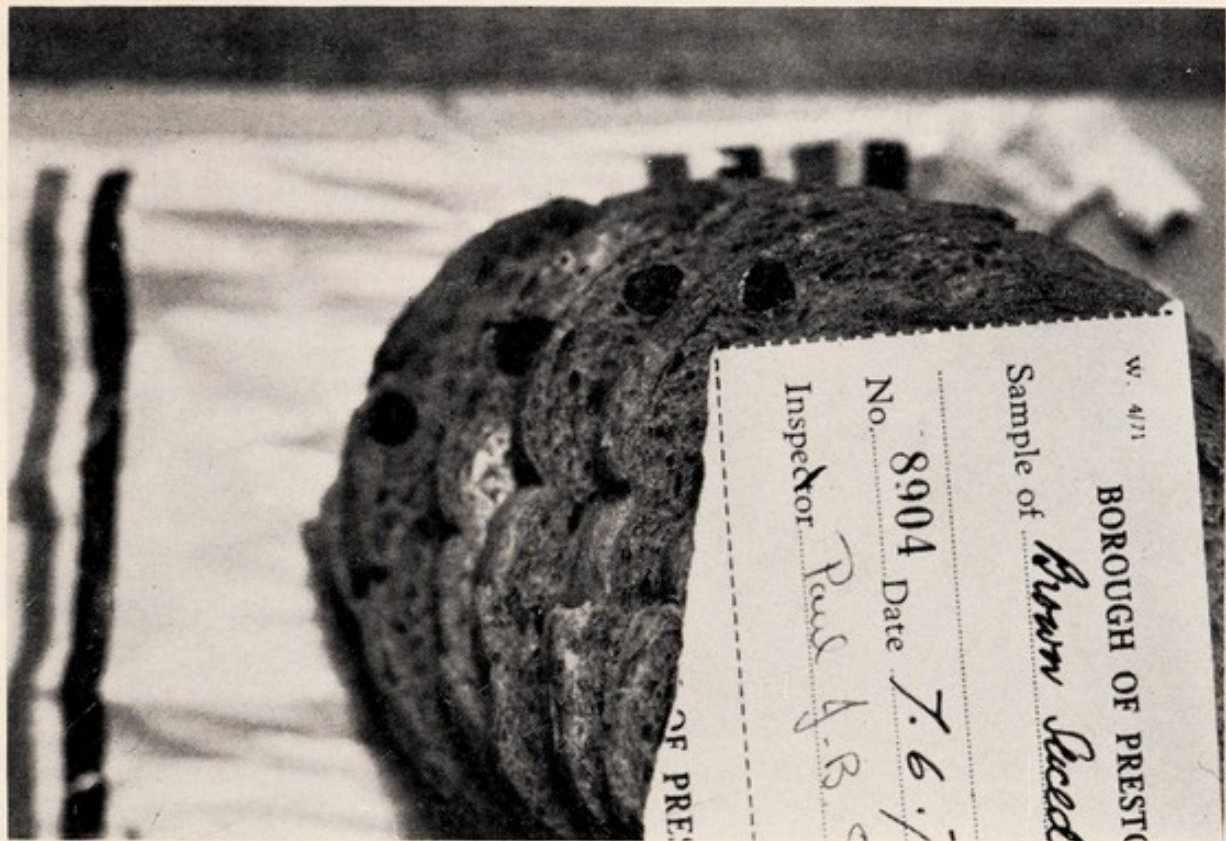


PLATE 28 Cigarette in Bread

sample 8904, a Barm cake containing cigarette debris sample E667, Ham sandwiches containing mouse droppings, sample 8901, Brown bread containing string, sample C2576, and Bread rolls containing cotton yarn, sample C2852. Bread samples were also submitted containing plastic from sealing rings and other sources, iron wire, flakes of paint, part of a salt bag, cotton yarn, iron stained flour from a baking tray, bitumen paper

laminate, jute rope, notepaper bearing instructions, and glass. In the case of the glass in sample C2817, the laboratory suggested that investigations be made at the complainants home—and within a day or two the complainant telephoned the laboratory to say that he had found a damaged butter dish which he thought might have been the source of the glass.

Now that there are six months allowed in which to bring complaint cases to court, some samples might reach court after this report is written. As far as possible these will be added to the items in Table 26 . . . but it is surprising how, particularly, among smaller authorities, one finds that cautions tend to be given over matters which one would have expected to reach court. Both cigarette debris and mouse droppings were involved with such samples in 1972. In one case, however, Sample 19/72, involving a cigarette end in pudding, the authority explained that the complainant had, at the last minute, expressed unwillingness to give evidence in court.

A parallel situation occurs with flour confectionery. The inclusions causing complaint ranged, during the year, from a hole lined with charred sugar in biscuit (sample 1692), charred apple in apple pie (sample 2319), and hard cooked unrisen dough in chocolate biscuits S9206 . . . , through . . . , the inevitable dirty dough and rust, in crumpets sample N5626, and a wire staple and a strawberry calyx in Strawberry tart (sample S9046 . . . , to matters which went to court . . . , like the Flour cakes with rodent droppings E37, scones containing nail (Sample West: 1765), and the custard pie containing turkey scales, sample S372. This last item is of interest because it was submitted as a cake which contained a finger nail, and indeed it was reported as such. It is illustrated in plate 29 where

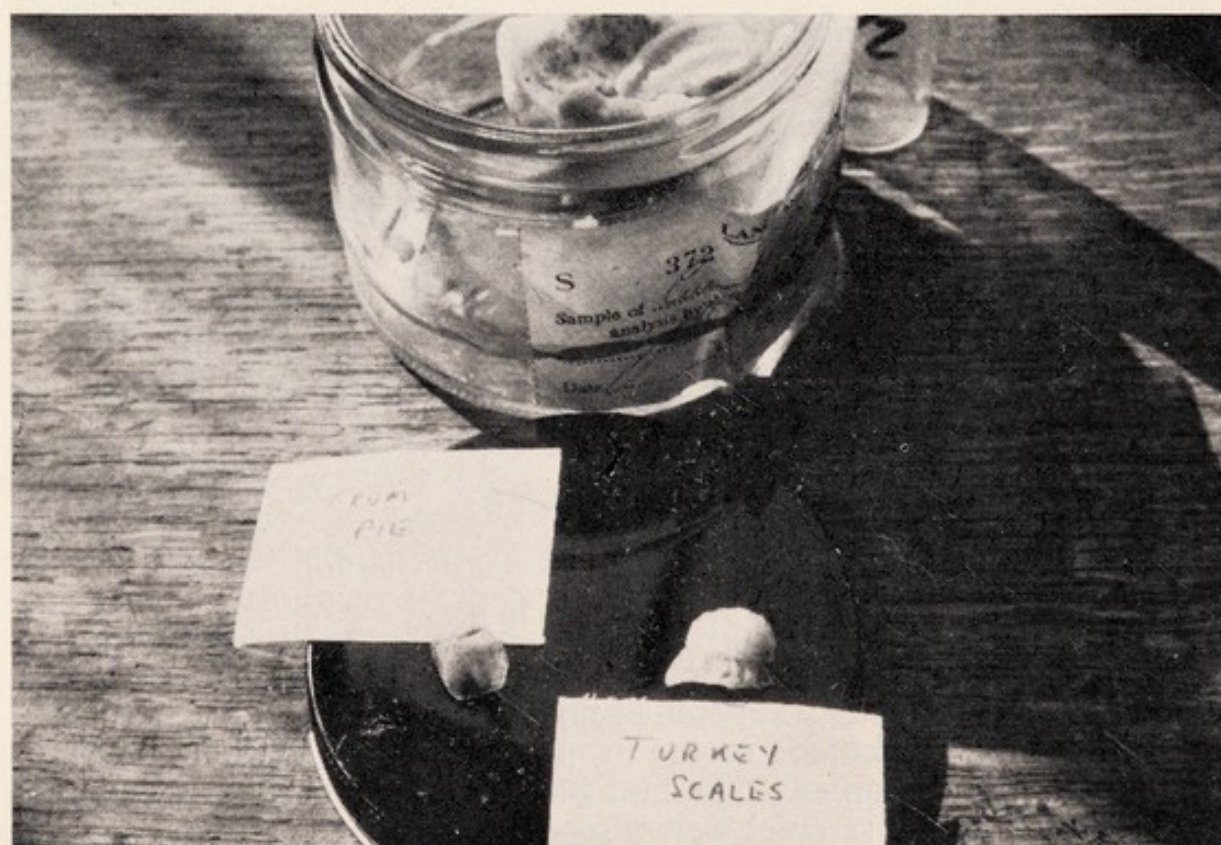


PLATE 29 Turkey scales

two other turkey scales are shown for comparison. Fortunately, mention had been made in the Statutory Certificate of unusual features—lack of blood, and scaling (suggesting disease), so that there was no difficulty about the Analyst attending court to say that he was satisfied that the item could have been a turkey scale when the defending solicitor put that possibility forward. It seemed that tendons were being drawn from turkey legs in a period before Christmas in a part of the bakery where the custard filling had been stored on the floor. One case which was dismissed, involved the cake samples C2908 and C2909. The analyst had merely been required to identify black objects submitted with the cakes, and these had proved to be rodent droppings. The complainants had presented an unshakeable story until they appeared in court, where, for the first time, they admitted that they had had mice in their home. Doubts about the origins of rodent droppings associated with biscuits (C2784) were resolved before prosecutions were thought about, but the laboratory was not brought up to date with sample C1721, Crumpets, with which a metal polish container cap had been associated, or with cake sample E9486 which contained PTFE film.

Sample N4763, part of an Eccles cake, contained parts of a greasy fruit box, but the lady who complained was not interested in causing a prosecution for material with a known association with the food materials from which the cake had been made. Nineteen samples of flour confectionery contained foreign matter, the foreign matter including White spirit (sample 2283), Flax fibres (sample N5489), Polypropylene (sample E543), Polystyrene (sample E661) a Muslin backed paper label (sample E665) and a nail (sample E957).

Canned food produced its quota of interesting extras. Thus mineral grease occurred in sample E9686 canned soup, a piece of blackboard chalk was in some canned pineapple, sample S9192, canned beans contained jute fibres in sample S8649, and charred bean debris in sample C1859. Carbonised food material had been incorporated into a continuous cylinder of 'egg' which passed through the middle of a Meat Roll with Egg (Sample 2316). The yolk of this re-made egg had a composition very close to that of a boiled egg but the white was drier than that of a boiled egg, having a moisture content of 75 per cent instead of 88 per cent, so that the protein content was higher . . . indeed it was twice as much as the normally occurring nine per cent in boiled egg white. A much torn and unidentified leaf occurred in canned tomatoes sample S9494, and jute string had been canned with the canned peas in sample E533. Fabric submitted with the canned peas sample, Chorley 004, was found not to have been cooked with the peas. Sample M334 consisted of raffia taken from a can of soup, and sample M786 consisted of sphagnum moss which had probably been gathered with the mushrooms in a canned chicken meal. Green staining from corrosion products from the can occurred with the luncheon meat sample S9199, and grey staining from a similar cause occurred with the meat N5452. There were one or two instances of careless trimming of meat. Thus sample E597 contained the object shown in plate 30 which appeared to be a phosphate renal calculus, but when something very like it was



PLATE 30 Steak and Kidney Pudding inclusion

submitted from Casserole Meat sample 8946 with the suggestion that it might have been part of a tuberculous lymph nodule a second opinion was sought. It could not be identified with certainty, but it was found to be another calculus associated with a secretory organ of some kind. Sample 359 was canned Irish Stew Ready Meal which contained wool fibres. The packers had withdrawn the consignment and replaced it with some having another batch number—but wool fibres were found to be in that batch also. Perhaps the oddest material of this kind was found in a can of stewed steak, sample S9119. The matt of material found in that sample weighed 7.8 grams, of which 2.7 grams were moisture and 1.8 grams were fat. The rest was hair mixed with stratified epithelial cells, which, for want of a better term, was designated "Bovine dandruff". Both a complaint sample, C1725, and a comparison sample, C1726, of canned steak and gravy, were found to contain bovine hair and hide, and the whole consignment was withdrawn from sale. Sample M82 was a specimen of the same material which had rather engagingly been labelled by the inspector, "Hide from school meals". No doubt this was not intended as an instruction. A sample of corned beef, sample 12374, was affected by traces of petroleum naphtha, and sample 8906, of canned fruit, was affected by traces of Derv—but it could not be established whether these oils had perhaps originally been splashed on the outsides of cans which had not been cleaned before opening. Sample S28 was a sample of canned Beans in Tomato Sauce, which contained a piece of knitted fabric.

At the end of every year the laboratory is inclined to look back and wonder why broken glass in baby food (sample E669) merits a fine of £80

with £18 costs, while bottled pickled herrings, sample C1723, which contained nine grams of broken glass did not reach court at all . . . but broken glass is still frowned upon by magistrates. There were twelve instances of broken glass being associated with food, seven of which went to court, but there were also some false alarms, as for example with sample C668 where the 'glass' in cheese spread proved to be disodium hydrogen phosphate, an emulsifying salt known to separate if its concentration is allowed to exceed three per cent. As already described, the complainant in one instance thought he had discovered the source of glass found in butter in his own home, and in two further instances where the glass was associated with foreign jams, the glass in the jam was different from that comprising the containing jars. In the last instance, with sample 2314, where parts of a meat pie so old that all trace of filling had disappeared and only yeasts and bacteria remained, the laboratory felt unable to comment on the fragment of glass which was submitted alongside the other debris. The woman who had been hugging the remains to her bosom was reported as having said that she expected £150 compensation, and she demanded all the specimen back again and was said to be instituting her own prosecution. The cases which did reach court may be checked on the table. One sign of the times involved a very large firm which had been associated with the glass found in gravy browning. Considering that their defence had been that they had packed 15 million jars and this was the first accident to have occurred, the fine of £30 plus costs was probably not the sort of sum which would cause them great concern, yet they found themselves having to ask for 14 days to pay . . . since it took that length of time to get such an odd sum of money out of their computer.

Emphasis upon the large numbers of units of goods marketed without trouble was made in connection with a chocolate bar in which a cigarette end occurred, and with a mineral water (sample S9203) in which a paper lemonade bottle label occurred. In the latter case the estimated annual output was given as 30 million bottles. Soft drinks were examined however, containing not only broken glass and the abovementioned label, but frayed cotton, a leaf, ash, fresh water plankton (these were involved in eight samples) dissolved metal from pourers, 21 milligrams of petroleum, and, in one instance, (sample S9263), a chicken bone! The said bone had been partly decalcified by the citric acid in the drink, and it had, like wool, preferentially taken up a great deal of the artificial colouring matter which had been used in the drink itself.

Besides the meat products already mentioned, the classes of food which involve meat were well represented, since hair and hide occurred in two sample of meat and potato pie, in two samples of steak pudding, in Salami, and as hog bristles in a product sold as Steak Pie. Rodent excrement was associated with meat pie and with sausages. Adhesive dressing occurred in a meat and potato pasty while zinc oxide plaster, which probably had been used to hold the lid on a food can, occurred in a Cornish Pasty. In the case of the sausage sample (N4720) which contained adhesive dressing intended for cuts, the complainant was initially unwilling to give evidence but then she changed her mind. There was a fine of £10

with £13 costs imposed. Cigarette ends were submitted with a meal of sausage, bacon and bread . . ., with part of a take-away meal, and with a piece of raw meat delivered to a school kitchen.

A sample of ham had been put down in sand somewhere during its life, and later appeared in the laboratory as a complaint sample. A piece of grease-proof paper was found inside a meat pie, textile fibres were found in a meat and potato pie, and a piece of corroding iron strip was inside a hot-pot pie. Pieces of wire occurred in a sample of meat pie filling, in a meat and potato pie, and in a sausage. Methyl Violet carcass marking ink was found in the contents of a meat pie and in a sample of sausages. Metallic staining occurred in sausages, in a pack called "Mixed Grill" which was made up of three items in a papier-mache tray and covered with cellophane, (these being a slice of salami, a slice of black-pudding and a slice of liver sausage). All were stained grey with finely powdered aluminium. And patches of metallic staining occurred in some canned ham and in some corned beef. Both were severe, the ham containing six and a half parts per million of lead, and the corned beef being in cans in which the plating was so severely lifting that the laboratory asked for further samples to see whether the whole batch in each case should be condemned. As such follow-up samples did not come in, perhaps the inspectors condemned the food on the strength of the one examination, or by simply opening a few cans. Sample C1773 was a sample of black-pudding which contained a 0.22 cartridge case. The manufacturer was fined £20 plus £13 costs.

Potato crisp products were involved in nine complaints—four of which involved unsightly deposits of ground-up potato debris with fat, in varying states of cleanliness; one with cotton fibres mixed in with similar material, two containing hair grips and one other containing paper towelling. Paper towelling also occurred in a sample of pickles. In the case of sample M143, which was one of the examples of dirty looking potato crisp debris, the member of the public who had purchased it was so incensed that he demanded and paid for a Statutory Certificate made out in accordance with Section 92(2) of the Food and Drugs Act. His find certainly looked revolting, but it was the cleanest of the deposits the laboratory had examined, so he was probably saved a great deal of expense by being deterred from conducting a prosecution when he read on the certificate of analysis that the material had an unpleasant appearance but consisted of wholesome food. (Similarly some sultana pulp which occurred in a sample of sultanas looked far worse than it was). In the case of sample C1730, the foreign matter in a crisp packet proved to be part of a conveyor belt. The route by which the sample had reached the laboratory does indicate why some complaints can never get to court. The lady who complained had returned the crisps to the swimming baths canteen where she had obtained them, and it was the Baths Manager who passed the complaint to the Public Health Inspector.

Sugar products complaints include a sample of granulated sugar contaminated with lubricating oil, some chocolate containing a deposit of cocoa shell, and some more containing iron stained cocoa. There were some

sweets containing a deposit of charred sugar, liquorice allsorts containing a chip of enamel, some sugar cigarettes containing a sliver of the board on which the paste was cut, a liquorice stick from Italy which contained a small fragment of metal from a grinding machine, and a toffee lollipop which had a coir fibre from a brush sticking out of it. Plate 31 shows a

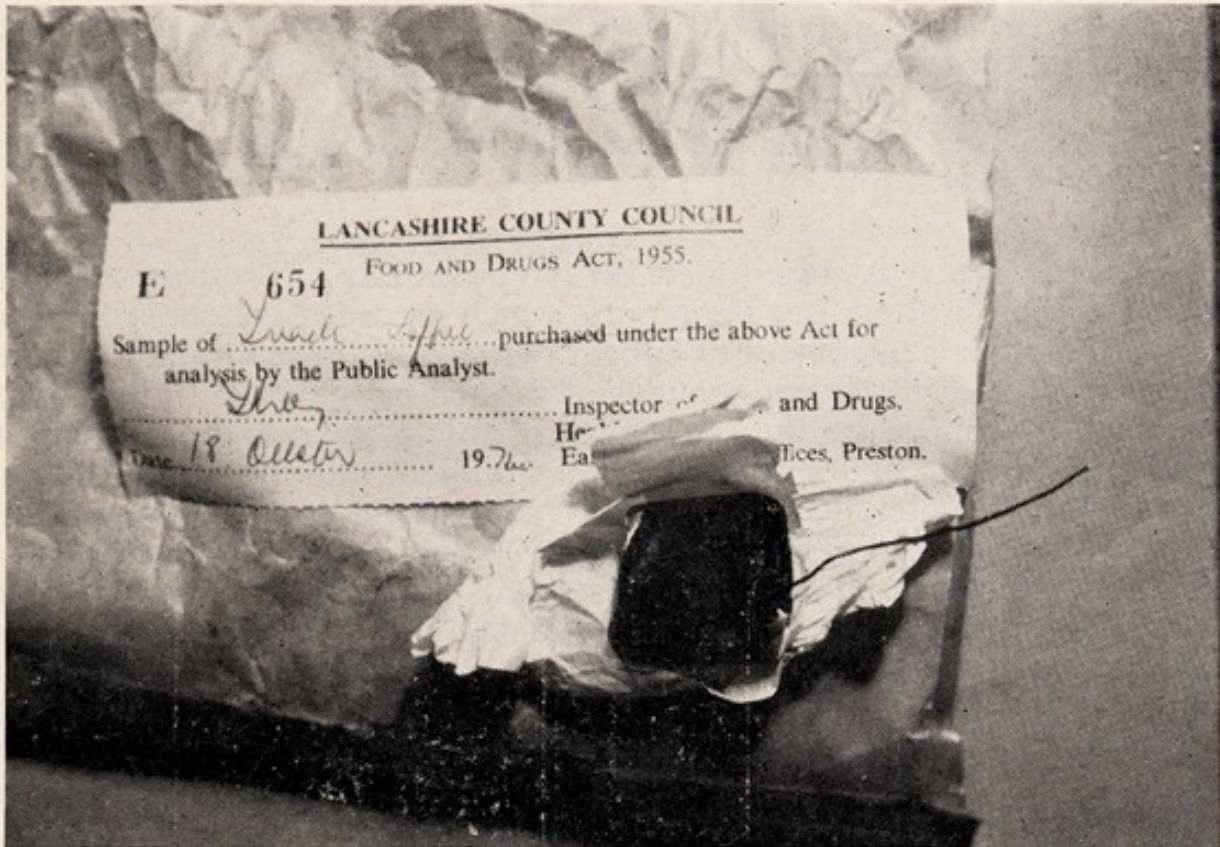


PLATE 31 Toffee and wire

treacle toffee from which a piece of iron wire protruded, and, in the related field of sugar sweetmeats there was ice-cream containing wood, choc ice contaminated with an alkaline silicate powder which the makers stated to be cleaning powder they had used, and a frozen mousse which contained a roller bearing and part of the race it had run in. A processing accident also seemed to be indicated with Demerara Sugar which contained clarifying materials and rust.

Further items which seemed to have been associated with manufacture included cheese containing a very battered metal nut, another sample of cheese which contained metal from a metal scour pad, flour which contained lubricant, dressed crab which contained crab shell, and mixed frozen vegetables which contained sterile decomposed vegetable matter held together by dead fungus. It also seemed likely that a restaurant meal which contained part of a throat lozenge had acquired it in the kitchens, and that a sauce-mix packet which contained a lead seal, like those used by the Electricity Board for sealing meters, had acquired it when the product was being packed.

On the other hand, some tapioca submitted from a school kitchen contained tapioca, sago, and mouse droppings—a mixture not duplicated in packets from the supplier, just as desiccated coconut from another school kitchen only contained mouse droppings in the opened packet! Instant coffee which contained lumps, had been splashed by water; another sample of Instant Coffee (E.9929), contained 30 per cent of gravy powder, which could only have been added in the complainant's home . . . and butter which bore surface markings of soot and rust might have acquired its contamination anywhere. One sample of dried milk powder did contain iron contamination, and two further samples of skimmed milk powder did contain carbonised milk, but the quantities present in each case were absurdly small.

The laboratory is always alert for the possibility of ordinary metallic contamination in food, but the reports which preceded the change in the standard for the lead content of baby foods caused the laboratory to take a special interest in the lead content of canned baby foods. In the foods examined in Lancashire the range of lead found in such food extended from 0.05 part per million to 0.25 part per million, with the average falling at 0.18 part per million. The laboratory is occasionally called upon to do little surveys on behalf of the Association of Public Analysts or the Ministry of Food, but when the findings fall inside existing legal limits nobody ever seems very interested in any results obtained. Nevertheless, some of the laboratory-initiated surveys of the kind are undertaken in anticipation of requests for information. The beginnings of an investigation into the metals contents of drinks from vending machines took place as a result of a complaint of sickness following use of a drinks vending machine (sample 8925). It petered out for want of samples.

As information becomes available in various fields, one becomes more and more tempted to believe that concern may often be expressed too forcefully and too early. The results published in 1972, of a survey carried out by the Department of the Environment into the effect of M1 motorway pollution on four different species of grass, showed, that at the end of a test period, their plots were growing, not four, but 54 different kinds of grasses and 384 different plants. Research conducted by Liverpool University has shown that most of the lead from petrol combustion dissolves in the surface layers of the sea, and is reasonably effectively scrubbed out of the atmosphere. As the world becomes over populated (if it does), there may have to be an acceptance of a certain amount of hazard in the environment. Mr. Yul Brynner, talking in a Parkinson programme, pointed out that the inhabitants of Peking suffer from a silicosis caused by the dust blown in from the Gobi desert . . . yet many Chinese would prefer to live in Peking than elsewhere. The Formosan crab (samples N4797 and N4858) which contained unusually high levels of zinc, indirectly sparked off another investigation, when a chemist for the firm stated that the EEC had made proposals for acceptable levels of zinc in foodstuffs, and that a level of 200 parts per million was to be permitted in eggs. A spokesman for the Ministry stated that he had no knowledge of such a proposal but that virtually anything can appear in EEC Drafts for

regulations. The laboratory carried out a series of examinations of eggs for zinc content and found none containing more than 14 parts per million.

One survey which ought to be conducted, is suggested by sample 1663, a complaint about oil taint in shrimps. The sample contained unsaponifiable matter 0.34 per cent, total hydrocarbons 170 parts per million, and hydrocarbons (eluted from an aluminium oxide column by benzene) 57 parts per million. There appear to be no figures published for untainted shrimps but work done in the laboratory some years ago on mussels indicated that some people might have been able to detect oil taint in mussels when the mineral oil content of the fish was of the same order of magnitude.

Prosecutions involving extraneous matter are listed in table 26.

Table 26
Prosecutions involving Extraneous Matter

Sample No.	Description	Nature of Irregularity	Result of Prosecution
N.4721	Part Meat Pie	Contained three strands of twisted wire weighing in all 58 milligrams.	Fined £30 and £3 costs.
N.4720	Sausage	Contained a wound dressing weighing 0.62 gram.	Fined £10 and £10 costs.
C.1773	Part Black Pudding	Contained the brass case of a spent 0.22 inch cartridge which had been rim fired, weighing 0.715 gram.	Fined £20 and £13 costs.
S.9304	Chocolate Bar	Contained the inner parts of a used cigarette filter tip, weighing 0.404 gram.	Fined £25 and £13 costs.
E.37	Flour Cakes	Contained one rodent dropping (together with rodent hairs) weighing 10 milligrams.	Fined £15 and £13 costs.
E.112	Hot Pot Pie	Contained a very corroded wafer of iron or very mild steel weighing 130 milligrams.	Fined £50 and £18 costs.
E.152	Bread	Contained a mild steel wire nail.	Fined £10 and £18 costs.
C.1893	Gravy Mix	Contained broken glass weighing in all 3.449 grams.	Fined £30 and £15 costs.
C.2576	Part Slice of Brown Bread	Contained a piece of eight-stranded cotton string weighing 0.165 gram together with 0.563 gram of adhering baked breadcrumb.	Fined £20 and £10.50 costs.

Table 26—continued

Sample No.	Description	Nature of Irregularity	Result of Prosecution
E.719	Mineral Water	Contained broken glass amounting to 0.469 gram. Another bottle labelled M.416 contained 0.975 gram of broken glass, making a total of 1.444 grams of broken glass in all.	Fined £75 and £13.30 costs.
C.2757	Part Bottle of Dandelion and Burdock	Contained fragments of broken glass weighing in all 1.42 grams.	Fined £50 and £23 costs.
C.2852	Finger Rolls	Contained two pieces of cotton yarn and four cotton threads weighing in all 85 milligrams.	Fined £20 and £10.50 costs.
E.656	Soft Drink	Contained fragments of broken glass weighing in all 1.335 grams.	Fined £50 and £18 costs.
C.2908	Almond Tart	Both samples contained loose fresh mouse droppings, the weight associated with the almond tart being 4 milligrams and that associated with the jam turnover being 3 milligrams.	Case dismissed
C.2909	Jam Turnover		
S.9227	Sausage	Contained a distorted cooked pellet of rodent excrement weighing 6 milligrams.	Fined £50 and £18 costs.
S.372	Custard Pie	Contained a detached finger nail measuring 11.5 millimetres in width by 18 millimetres in length and weighing 47 milligrams.	Fined £10 and £15.50 costs.
E.667	Part Barm Cake	Contained shredded tobacco and a fragment of white, fine-fibred paper resembling cigarette paper, all derived from a cigarette and weighing 0.160 gram.	Fined £50 and £18 costs.
E.669	Baby Food	Contained two pieces of broken glass, one weighing 3.53 grams and the other weighing 0.012 gram.	Fined £80 and £18 costs.
Leigh B. 2/42	Part of a Pasty	Contained a strip of adhesive plaster weighing 0.67 gram.	Fined £25.
Preston C.B. 8904	Bread	Contained part of a smoked cigarette weighing 0.95 gram.	Fined £20 and £5 costs.
Preston C.B. 8940	Milk Dregs	Contained broken glass weighing in all 9.49 grams.	Fined £10.

Table 26—continued

Sample No.	Description	Nature of Irregularity	Result of Prosecution
South-port C.B. 1683	Steak and Kidney Pie	Heavily contaminated with bacteria and T.V.N. 44 mgms./100G.	Fined £90 and £12 costs.
West-morland C.C. 1765	Scones	Contained an iron wire nail weighing 0.68 gram.	Fined £30 and £16 costs.
Leigh B. 3/38	Cooked Chopped Meat and Onion Savoury	Contained the filter-tip end of a smoked cigarette weighing 0.168 gram.	Fined £25 and £7.50 costs.
M.847	Milk	Contained broken glass weighing in all 5.511 grams.	Fined £25 and £15 costs.
Preston C.B. 8901	Ham Sandwich	Contained 18 mouse droppings, weighing altogether 59 milligrams.	Fined £30 and £20 costs.
Preston C.B. 8909	Jam	Contained a piece of broken glass weighing 0.222 grams.	Fined £30.
Preston C.B. 8935	Prepacked Mousse Dessert	Contained parts of a roller bearing and race made of steel and weighing 6.714 grams.	Fined £50.
Lancaster City M.5	Milk	Contained cement mortar weighing 0.398 gram.	Fined £15 and £5 costs.

SAMPLES CONTAINING INSECT OR SIMILAR CONTAMINATION

There were seventy-seven complaints about insect or similar remains in food in 1972, and, in one routine sample of ginger marmalade, sample C2889, the hind leg of a bee was found. In addition, submitted as miscellaneous samples, and separated from the articles with which they were said to have originated, the laboratory had submitted to it some carpet beetles (sample 784), a cricket nymph (sample M961), some water snails eggs (sample M049), a woodlouse (sample M218) and a foreign beetle which defied identification (sample M344) but which had been processed in a manner which lent support to the allegation that it had been found in a can of fruit.

It would not be quite true to say that bread and flour products were foods most concerned with this form of complaint in 1972, but they were well represented. The eleven samples of bread yielded up remains of moth, fly, wasps, ichneumon fly and beetle, while flour confectionery gave a living

tropical warehouse moth in Christmas pudding, Mediterranean flour moth in a cake, a housefly in doughnuts and in a cake, lesser housefly in some biscuits, small pieces of bluebottle in a coconut sponge cake, an uncooked wasp head in the jam insertion hole of a doughnut (suggesting that the body had been knocked off with some vigour while the wasp had been feeding), a dead larva of the beetle *Niptus hololeucus* in part of a chocolate coated biscuit, and a *Ptinus tectus* beetle in part of a sandwich cake. A sample of breakfast cereal contained the dried out abdomen of an insect damaged beyond identification, and another sample of breakfast cereal with milk contained a spider, but whether it had been associated with the milk or with the cereal could not be decided.

Not always does the laboratory agree that there are grounds for complaint. There was a fly too damaged to identify associated with a sample of bread, but it had certainly not been cooked in the bread (sample S8621), the housemoth larva said to have been found in a jar of Baby food was still alive (sample C1770), a full-cream-milk baby-food submitted with a housefly proved to be a case where the fly had gained access after the food had been packed (sample N4819) and a similar sample containing a house moth larva (sample S8650) was felt to represent an unlikely fault to be visited upon a manufacturer. The fact that the respective insects had not been cooked showed that a fly submitted with some canned peas (sample S9224), a wasp submitted with some canned pears (sample E390), a clay coloured weevil in some canned beans in tomato sauce (sample E9808), an uncooked fly in cooked beefburgers (sample 1680) and a fur beetle submitted with some roast turkey (sample 3), had not been present when the foods were prepared. The spider in Orange Drink S230 was far too fresh to have been bottled with the drink. On at least two occasions the laboratory's findings made feelings run high. With sample S9228, canned ham from a school kitchen, the bluebottle which was embedded in the fat on the side of the meat was quite uncooked and must have been acquired when the meat was put down after the can had been opened. Sample C1727 was Drinking chocolate in which there was a grub of *Ephestia cautella* moth. It had been dead for some time but the most likely source of infestation would have been an egg acquired at the factory—*Ephestia cautella* does not survive well in Britain. A statutory certificate was issued, but apparently the complainant had declared that she had seen the grub wriggling, (for some people, grubs and wriggles are inseparable) and the screwed-up certificate was hurled back into the laboratory in a fit of such tantrums as the laboratory had thought to have seen the last of in 1967 . . . but ever since the days of Galileo fact and autocracy have collided in the words, "Eppur si muove".

Ephestia cautella (Tropical Warehouse Moth, or Cocoa Moth) caused one or two doubts in 1972. A letter from the Pest Infestation Control Laboratory in Slough, and dated 7th April, 1972, cleared up some of the problem, by explaining that this moth hardly ever survives a winter in Great Britain. There have been one or two exceptional cases where it has survived in heated warehouses attached to supermarkets, and in the mild winter of 1971–2 there had been survivals of faulty fumigation in unheated warehouses. The letter was a reply to inquiries about some Dried

Dates (Preston RDC 1), in which living Cocoa moth larvae had occurred. The importer stated that the name on the label had been changed 'long ago', that dates cannot be infested while on the palm tree, and that dates are all fumigated immediately after harvesting and again before shipment, with methyl bromide. The writer in Basrah stated that the firm had an office in London "to whom we are forwarding a copy of your letter for their kind attention too, with sincerest wishes" . . . The pest infestation laboratory knew of shipments of dates found infested on arrival, and gave the opinion that infestation *can* occur on the tree . . . a possibility made even more likely in this instance by the fact that the seat of infestation was found to be the remains of a date flower. The dates had also been visited by saw toothed grain beetle.

Food inspection by public health inspectors has a distinct bias toward food hygiene. This curious little observation may account for a rather larger number of insect infestation prosecutions in an authority where there are public health food sampling officers, than where there are Weights and Measures food sampling officers . . . but the innate keenness even of public health inspectors can be thwarted by the extraordinary behaviour of members of the public. Sample S9205 is an example. It consisted of a cooked meal, namely King Prawn Chow Mein with chips, which was purchased as a hot meal, warmed up again and transferred to a hot plate from which the purchaser decided that he did not like prawns after all, so he discarded them. He then found a fly and searched through the whole meal. He said that he found two more flies which he placed on cardboard while he retrieved the foil dish and its cover, then he returned the meal to the foil dish and placed it *on top* of the retrieved flies on their cardboard, in a paper bag. This he gave to the inspector, who brought them, still one on top of the other, to the laboratory. The laboratory received a domestic housefly in parts, and, when it had been reassembled, what proved to have been parts of a parasitic wasp. In the meal itself the laboratory found slug excrement . . . but where these items had gained access to the meal was not beyond dispute, and it was fortunate that the complainant was reluctant to act as witness. The laboratory therefore suggested that the food washing arrangements at the place of preparation be investigated.

Usually for reasons of this kind, but sometimes because autonomous authorities have not stated what action they may have taken, it is impossible from the laboratory's records to find rhyme or reason in why some samples have found their way to court and others have not. It must be a luxurious life to be answerable to no-one. Thus, among meals, sample S9901, 'Beefburger and chips containing a cockroach' resulted in a prosecution, but samples 2445 'Chop suey roll and spider', S9637 'Savoury meal with greenbottle', and S9818 'Savoury meal with bacon beetle larva' did not. With sample E824 it was not possible to say with which part of the meal the housefly found had been associated. In the occurrences involving flies, sample C2150 'Meat pie and housefly', E229 'Vegetable pie and spider', 16/72 'Meat pie and housefly', and 99 'Steak pie and housefly' there were prosecutions. With E382 'Vegetable pie and half a fly' E222 'Cheese and onion pie and fly', and 1707 'Meat and potato pie and parts of a slug'

there were no prosecutions. With E658 'Fish fingers and bluebottle' there was a prosecution, but with S299 'Fishcake and a cooked earwig' there was none. Dried apricots containing ants and fruitfly (samples E9726 to E9729 inclusive) were all withdrawn from sale.

A centipede in some baby food (sample E200) had been heated up by the child's mother and it was not possible to say whether it had been in her own saucepan or in the food. A cast larva skin found in Dried Baby-food 131/72 gave rise to a caution. As with the centipede, the moment of association of a bluebottle found in minced beef sample 166 with the food could not be established. Beetles in Orange Drink, sample 163/72, and fruit fly puparia adhering to the inside surfaces of a bottle of Lager, sample S9225, resulted in cautions, and so did insect webbing and excrement found on sample S25, which consisted of Rum-flavoured truffle sweets. Inspection of premises was all that could be undertaken with a sample of ground rice (sample 564) and another of dried peas (sample S9525) which were found to be alive with booklice.

Canned foods represent a special problem. Many canned foods are imported, and importers can often show that they have inspection systems which establish 'due diligence' in checking the quality of their incoming foods. In many cases therefore, small creatures found in imported canned foods resulted in cautions to the importer rather than prosecution. Some prosecutions are taken, over canned foods which contain insects, however, and examples are Raspberries, sample F76, which contained moths, and Canned beans, sample C1826, which contained parts of a wasp. Cautions were issued with the samples, S378 Canned beans with a winter gnat, E9398 Canned fruit with a tenebrionidae beetle, S9560 Fruit cocktail containing most of a ground beetle, S229 Pineapple chunks containing a sap feeding beetle which must have been associated with the growing fruit, 78/72 Canned Plums containing a worker bee, C1876 and S409 Canned Tomatoes containing a housefly each, E9605 Canned Vegetables containing a ground-beetle, and E768 Canned soup containing parts of a spider.

Perhaps the most interesting occurrence, however, involved canned cherries, samples N5852 and N5853. The first of these samples consisted of two opened cans of cherries which the complainant stated to have been provided by the importer in exchange for one in which she had found grubs. When examined by the laboratory one was found to contain eight larvae of cherry fruit fly and the other contained twenty larvae of cherry fruit fly. The second sample reference number was given to another can purchased by the inspector from the shop from which the lady had bought her original can. That sample contained three larvae of cherry fruit fly. The laboratory first made sure, by consulting the Chipping Campden Fruit and Vegetable Research Association, that there was no permitted limit for these extremely hard-to-find larvae in cherries, and after being assured that freedom from them was something written into all contracts, it caused the importer to be contacted. His consternation was extreme . . . and he arranged for the withdrawal of all stocks. The larvae are small and they get into the fruit close to the stone. The complainant said that she would

not have found them, but she was called away for a moment when her toddler was eating some of the cherries, and it was he who had splashed fat clumsy hands upon the fruit and had discovered the "maggots". The lad will probably grow up to be an analyst!

The possibility of there being an accepted limit for such infestation is not as outlandish as one might suppose. Sample C1759 illustrates the point. It was a complaint sample of fish fingers in which a parasitic cod worm had been noticed. The White Fish Authority model purchase specifications accept up to three such worms in every half stone of fish, so the discovery of *one* is rather like seeing a swallow in January.

Prosecutions involving infestation are listed in Table 27:—

Table 27

Samples containing Insects, Insect Matter, etc. about which Legal Proceedings were instituted in 1972.

Sample No.	Description	Nature of Irregularity	Result of Prosecution
S.8822	Cake	Contained parts of a damaged fly weighing 2.5 milligrams.	Fined £20 and £13 costs.
C.1826	Opened Can of Baked Beans	Contained part of a wasp weighing 29 milligrams.	Fined £20 and £10 costs.
E.25	Barm Cake	Contained one male Mediterranean Flour Moth weighing 2 milligrams.	Fined £30 and £13 costs.
S.9905	Chips and Battered Beefburgers	Contained one cooked female common cockroach weighing 0.60 gram.	Fined £10 and £11 costs.
E.229	Vegetable Pie	Contained a small spider weighing 3 milligrams.	Fined £15 and £18 costs.
C.1745	Bread Roll	Contained the greater portions of the damaged wings, the antennae and parts of four legs of a moth, weighing in all less than 1 milligram.	Fined £5 and £8 costs.
C.2150	Part of Meat Pie	Contained a fly.	Fined £50 and £15 costs.
C.1750	Muffin	Contained a dead fly weighing 6 milligrams.	Fined £5 and £3 costs.
S9211	Barm Cake Sandwich	Contained a dead slug weighing 24 milligrams.	Fined £20 and £13 costs.
S.9839	Bread	Contained one worker wasp weighing 50 milligrams.	Fined £25 and £28.50 costs.
C.2620	Brown Wholemeal Loaf	Contained the greater part of a moth weighing 8 milligrams.	Fined £50 and £18 costs.

Table 27—continued

Sample No.	Description	Nature of Irregularity	Result of Prosecution
E.657	Finger Rolls	Contained a common housefly, entire except for the head, weighing 6 milligrams.	Fined £20 and £18 costs.
E.658	Fish Fingers	Contained the greater part of a fly weighing 48 milligrams.	Fined £50 and £19.50 costs.
Accrington B. F.76	Part Can of Raspberries	Contained a dead cooked moth weighing 0.240 gram and dyed with the permitted synthetic food colour Ponceau 4R.	Fined £10 and £18 costs.
Chorley B. 099	Part of a Meat Pie	Contained a domestic housefly, weighing 21 milligrams.	Fined £7.50.
Middleton B. 167	Milk	Contained remains of fly infestation weighing in all 145 milligrams.	Fined £10.
Morecambe & Heysham B. C.16/72	Meat Pies	Contained 222 live bluebottle larvae weighing 3.3 grams.	Fined £30.
Westmorland C.C. 1751	Bread	Contained the greater part of a cooked worker wasp weighing 24 milligrams.	Fined £30 and £21.55 costs.

FOODS AFFECTED BY FUNGUS, YEASTS OR ALGAE

Fifty-nine samples were criticised by the laboratory in the year 1972 because of damage by micro organisms. At the time of writing, nine of those had been involved in prosecution proceedings, but now that a six months period is available in which to lay informations in connection with complaint samples, the table may eventually show a greater number by the time the report is assembled for printing.

It is rather astonishing, in a year when so much was said about date-marking and adequate inspection of food stocks, that so much mould-damaged food should have been encountered. The number of adverse reports was swelled, however, by the trailing end of the campaign to clean up the canned tomato products. That it was the trailing end of the problem is indicated by there having been no samples of tomato *purée* encountered in which mould fragments were visible in more than half a test number of fields examined under a microscope. In 1971 there were still several samples of *purée* examined in which large amounts of mould were found.

The Sea and Air Port Health Authority Association (Secretary Dr. Hutchinson, M.O.H., Hull) first asked for limits of fifty per cent of positive

fields and twenty-five per cent of positive fields to be imposed on imported Tomato Puree and Canned Tomato Juice respectively, but the following proportions of positive fields were found in some of the samples of tomato juice examined in 1972:—

<i>Sample number</i>	<i>Percentage of fields in which mould fragments were present</i>
S.9625	45
70	50
128	50
147	83
152	34

As there were only fourteen samples examined, it would appear that there may still have been some cans remaining from before the date in 1971 when it was announced that these standards were going to be adopted. The firm whose product showed 83 per cent of positive fields, however, made the ingenious defence that their product was made by diluting purée which came into the country complying with the standard of fewer than fifty positive fields in every hundred, but that those mould fragments which were present became broken up as the purée was agitated with water to reconstitute 'Juice'. This method of reconstituting "juice" seems to be accepted in EEC draft regulations.

The tomato juice in which some canned tomatoes were packed was rather less satisfactory than tomato juice canned as such. The following amounts were recorded :—

<i>Sample number</i>	<i>Percentage of positive fields</i>
E.9943	89
4/1	100
12B/1	60
12E/1	50
E.127	100
E.257	94
8920	75
3/43	88

Initially, the laboratory attempted to impose the same standard for the juice around canned tomatoes as that imposed for whole juice, but one firm replied pointing out that The Codex Alimentarius Draft Standard CAC/RS 13-1969 recommended a limit of fifty per cent of positive fields in juice from Tomatoes canned in juice, and although the Codex Alimentarius standards will need to be agreed by all nine of the European Community members, the laboratory felt that the 50 per cent standard would probably be the more reasonable one to press at the present time.

Most of the canned tomato juice samples requiring action are likely to be sent from ports or container terminals . . . something which raises one more query among many in connection with the question of who, after reorganisation, will be sending samples to the Public Analyst. Section 3 of the Public Health Act retains the Port Health Authorities, but Food and Drugs Inspectors may come into any port when dealing with matters originating outside the ports. The present impression continues to be that the future will bring millions of inspectors swarming into the laboratories with samples from everywhere.

If the word is applied loosely, perhaps drinks were the next most frequent foods to display fungal contamination. Thus, the mouldy bottles containing Ginger Ale and Limeade (samples C1766 and C1767) gave rise to successful court proceedings. Samples S12 and S13 which involved mouldy ginger ale, resulted in cautions. The diluted Dubonnet which grew yeasts (sample C1860) has already been mentioned in the section on alcoholic drinks, and every year produces at least one sample of shandy, like sample E9415, in which yeasts have begun to grow again. *Penicillium* type moulds were found to be growing in samples C1734, N5268 and N5269 which all consisted of cordial which had been sealed inside plastic packets with the idea of putting them into home refrigerator ice boxes, in order to make home-made ice lollies. People who have tried this will know how very cold the ice box needs to be in order to overcome the freezing point depression caused by separating ice leaving stronger sugar solution behind, until the home-made lolly has become a never-setting mush of pure ice and entrapped syrup. If the confection is also liable to contain mould, one would not expect to find many customers enthusiastic about these products.

Bread and flour confectionery samples accounted for only five of the complaints, but two of those were taken to court. Dairy products accounted for another five samples of mouldy food, and four samples of sugar confectionery were submitted, all growing mould because of condensed moisture inside unventilated polythene bags.

Meat pies and sausages were involved in samples PRDC 2, 20/72, S9191 and M962. The steak and kidney pie, 1683, was undercooked and severely affected by bacteria, so that magistrates took a very serious view of it and imposed fine and costs amounting to more than a hundred pounds. The mouldy sausage roll, sample F100, brought a fine of only £5 with £18 costs. Perhaps a large fine would have resulted if sample 1789 had been paid for. It was a trout, supplied as part of a restaurant meal, and all inside the gutted area there was a fine growth of a *penicillium* mould. (Plate 27). It was felt however, that as the irate customer had refused to pay for his meal he could hardly be said to have been prejudiced.

Five canned foods were submitted in which matts of mould growth had originally covered the surface of the food, and sometimes had been mistaken for unpleasant inclusions after the food had been mixed. In all these instances the cause proved to be damage done to the can by carton opening knives. In four cases the moulds were *penicillium* type moulds

and in one case it was an Ascomycetes. It is astonishing to see how pure the cultures tend to be in these cases. It is as if only a single spore originally entered the can. In the case of sample PRDC 3 which was a mouldy chicken meat paste, the jar had fractured.

Three samples of margarine were submitted, growing mould; two of them having later become the subject of a successful prosecution.

Perhaps the most interesting sample was sample PRDC 5, a sample of canned Minestrone Soup in which the pieces of spaghetti present proved to have been growing mould before they were put into the can.

The most useful piece of information in this section resulted from experiments conducted upon the sausage samples S9191 and M962. With those, it was established that it took one month at 1°C to produce a mould growth which at room temperature took only four days. Similar experiments with butter suggest that the penicillium moulds will only grow, and then only slowly, if the butter is kept at room temperatures. In one experiment, even so, no appreciable increase in the size of a culture occurred in a period of three months. A more rapidly growing mould of the order Sphaeropsidales increased its colony size in butter, but even this slowed to nothing in chilled butter. It rather looks as if the incidence of mould in such fatty foods is an indication of very careless storage, almost totally unrelated to age.

Table 28

Prosecutions involving samples containing Mould, 1972

Sample No.	Description	Nature of Irregularity	Result of Prosecution
C.1766	Ginger Ale	} Contained pieces of dead fungal mycelium and colonies of fungus were attached to sides of bottles.	} Fined £30 and £9 costs.
C.1767	Limeade		
Fleet-wood B. 1	Spongecake	Contained areas of green mould growth measuring approximately 4½ square inches.	Fined £5 and £23 costs.
Accrington F.100	Sausage Roll	Contained areas of mould growth of a <i>Penicillium</i> species.	Fined £5 and £18 costs.
Blackburn C.B. 533 534	Corn Oil Margarine Corn Oil Margarine	Both samples contained areas of mould growth of a <i>penicillium</i> species.	Fined £75.
Kirkby U.D.C. 2290	Bread	Contained fragments of hard, unrisen and mouldy dough and also contained three small beetles.	Fined £25 and £10 costs.

Table 28—continued

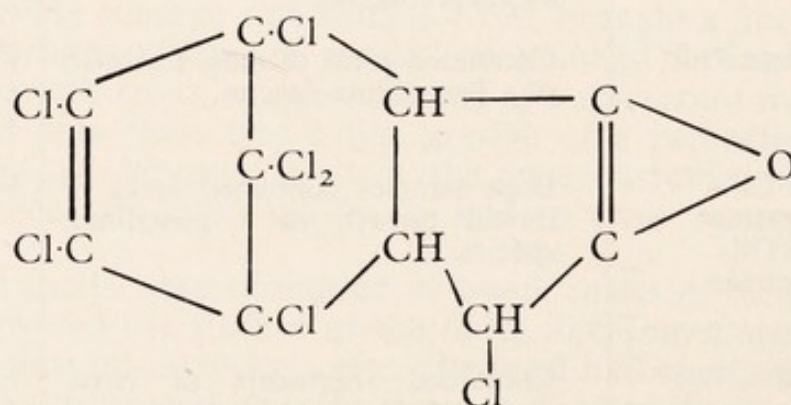
Sample No.	Description	Nature of Irregularity	Result of Prosecution
More-cambe & Hey-sham B. C.20/72	Part of a Meat Pie	Contained two areas of sporing mould growth of a penicillium species.	Fined £10 and £15 costs.
More-cambe & Hey-sham B. C.21/27	Milk	Contained several particles of dead mould weighing about half a milligram.	Fined £10 and £6 costs.

PESTICIDE AND FUNGICIDE RESIDUES IN FOOD

The analyses for the purposes of the third year of the *Joint Survey of Pesticide Residues in Foodstuffs Sold in England and Wales* which has been organised by the C.C.A., the A.M.C., the U.D.C.A. and the A.P.A. were carried out in 1972. Lancashire laboratory examined one hundred and fifty-three samples submitted under the scheme, and fifty other Food and Drugs samples besides.

Statistically selected samples of foodstuffs in the scheme have been obtained in seven geographical zones, Lancashire forming part of Zone 5, which, in total, comprises eight counties and thirty-one Municipal and Urban Authorities.

As may be seen from Table 29, residues of Benzene Hexa-chloride, Dieldrin and D.D.T. compounds are widely distributed, very small amounts having been found in one hundred and nineteen of the samples examined. In addition, traces of heptachlorepoxyde occurred in a sample of lard, another of cheese and in a sample of suet, but no other chlorinated pesticides were found.



HEPTACHLOR EPOXIDE

No residues from organophosphorus pesticides were detected, but this admission amounts to being a reminder of a sequence of disappointments. A thermionic detector for the G.L.C. equipment, which had been ordered specially for the survey, ran straight into difficulties with the power cuts of the time. When the voltages were restored, it was found that the detector was faulty, and new tips were ordered. When those arrived they were found to be of the wrong size. The firm eventually discovered that the tips were the correct ones, but the detector which had been provided was of an obsolete pattern and had to be replaced. The correct one did not work, so equipment running-time was clogged with servicemen who struggled to make the tools of modern science behave a little less like a politician, and provide consistent and reliable information. The service men said this had been achieved in November, but by then the combined inspectorate from all the authorities was trying to submerge the department with samples, so there was no opportunity to use the equipment in the survey.

The problem with phosphorus pesticides is that they break down into a large number of chemicals, so that residues of a spray preparation which might have been applied in as large a quantity as one uses with other sprays can remain on the plant as minute amounts of a large number of breakdown products. It had been hoped that the new equipment would enable some comment to be made about this, but under the circumstances the less sensitive procedures of earlier years had again to be employed.

Table 29
Organochlorine pesticide residues in Lancashire foods 1972
(Parts per thousand million)

Type of Sample	Total BHC Isomers	Dieldrin	D.D.T. including D.D.E. and T.D.E.	Other Residues	No. of Samples Examined	No. of Samples Containing Residues
Cheese	149, 97, 33, 25, 23, 21, 20, 10, 9	70, 19, 15, 13, 12, 11, 9, 6, 5	19	heptachlore-poxide 39	11	10
Butter	464, 18	65, 5	330		2	2
Lard	35	25	82, 53, 35	heptachlore-poxide 28	3	3
Vegetable Oil ...	140, 12	7	29		5	3
Dripping	51, 25	39, 27	50		2	2
Lamb	12, 8, 7, 5	9, 8, 5	411, 186, 15, 12		13	6
Suet	90, 50, 16	18, 9	47	heptachlore-poxide 10	3	3
Sausages	21, 16, 8	9, 7	21, 19, 7		6	4
Corned Beef ...	2	5	5		2	2
Milk	14, 11, 11, 4, 2, 1, 1	5, 4, 3, 3, 2, 2, 2, 1.5	14, 8, 7, 6, 6		13	10

Table 29—continued

Type of Sample	Total BHC Isomers	Dieldrin	D.D.T. including D.D.E. and T.D.E.	Other Residues	No. of Samples Examined	No. of Samples Containing Residues
Infant Foods ...	22, 13, 5, 2, 1	29, 2	45		5	5
Bread ...	143, 11	2			3	3
White Fish ...	19, 7, 1	20, 12, 11	88, 39, 15, 9		14	5
Herrings ...	20, 19, 6	118, 109, 11, 10	150, 94, 31		4	4
Shrimps ...	40, 15		23, 20		3	2
Mussels ...		9, 8	22, 14		2	2
Tinned Fish ...			120, 70, 46		3	3
Cockles ...	11				1	1
Cooked Lobster ...			50		1	1
Cooked Crab ...			90		1	1
Apples ...	21, 19, 15, 15, 14, 7, 4, 3, 2		112, 80, 80, 50, 27, 15		20	14
Pears ...	7		8, 3		6	2
Peaches ...	12, 3		145, 6		5	3
Oranges ...	13, 7				9	2
Lemons ...					1	0
Grapefruit ...	29				5	1
Tangerines ...					1	0
Macedoine of Vegetables ...					1	0
Tomatoes ...	35, 25, 10, 2	21	90, 35		8	6
Lettuce ...	1, 130, 214, 54, 40, 24, 22		2,083, 25		20	7
Watercress ...	6				3	1
Mushrooms ...	730, 120, 23	117	20, 5		5	3
Celery ...	11, 4		60		7	2
Turnips ...					4	0
Spring Cabbage ...	6				1	1
Peas ...					1	0
Broccoli ...					1	0
Brussel Sprouts ...	5				1	1
Gooseberries ...	4, 2				2	2
Plums ...	9				3	1
Strawberries ...					1	0
Winberries ...	2				1	1
Totals ...					203	119

Polychlorinated biphenyls

These materials, as manufactured and sold, consist of complex mixtures of the forty or more possible chlorinated derivatives of diphenyl. These compounds have been in use since the nineteen thirties in the manufacture of plastics, paints, adhesives and for electric transformers. They are very stable when they become dispersed in the environment, and it is only in very recent years that the danger of their accumulation in the food-chain has been realised, and steps have been taken to limit their manufacture and usage. Improvements in analytical separation methods have revealed that some of the figures previously quoted in the literature for such chlorinated pesticides as dieldrin, aldrin, D.D.E. and D.D.T. in wild-life, were possibly partly due to these compounds. In analysis, the polychlorinated biphenyls are extracted with the chlorinated pesticides and they are not removed in the usual purification stages. In gas chromatographic separations they gave a whole series of peaks which mimic the chlorinated pesticides. Recently, it has been found possible to separate them from most of the pesticides, by means of partly deactivated silica gel and liquid chromatography.

The polychlorinated biphenyls eventually find their way into the sea, and then they tend to be concentrated from the water into fish and from thence into sea birds. In particular, polychlorinated biphenyls were linked with the deaths of thousands of sea birds in the Irish sea in 1969. Sewage sludge can contain about 0.3 parts per million polychlorinated biphenyls (on a wet basis) and over 1,000 lbs. of these compounds are deposited each year in the Clyde Estuary alone, as a result of sludge dumping. (See 1/1973 SCAN—Pye Unicam page 9).

Polychlorinated biphenyls were estimated in the twenty-five samples of fish examined for pesticides in County Laboratory in 1972, with the following results (expressed in parts per 1,000 million).

Table 30

Polychlorinated biphenyls in Fish

Herrings	1450, 340, 0, 0
Cod	16, 0, 0, 0
Plaice	53, 31, 19, 0
Halibut	0, 0
Haddock	0, 0
Coley	30
Pilchards, Canned	70, 0
Salmon, Canned	12,
Shrimps	0, 0
Cockles	84
Mussels	570, 63

Nitro-chlorobenzene Fungicides

Tetrachloro nitrobenzene residues of 1·63, 0·03, 0·02, 0·01 and 0·01 were found on five samples of lettuce, and 0·14 part per million was found on one sample of mushrooms. Pentachloro nitrobenzene residues of 6·8 parts per million, 1·57 parts per million, 0·48 part per million and 0·01 part per per million were found on four samples of lettuce. The first of these may be regarded as being excessive if it is compared with the Netherlands limit of 3 parts per million, although in Britain there is no statutory limit for such residues. Unsuccessful attempts were made to trace the importer.

Examinations were also carried out for the following residues.

Copper

Copper carbonate is listed as a permitted preservative for pears, in the first schedule to the preservative regulations. In addition, Bordeaux Mixture (lime and copper sulphate) is still a popular treatment for many crops. Twenty samples of apples, six samples of pears, eight samples of tomatoes and seven samples of celery were all shown to be free from copper residues.

Lead Arsenate

This rather old fashioned treatment, particularly for apples, used to leave residue near the stalk and flower of many imported fruit. The apples, pears and grapes mentioned above were examined, but all gave negative results for lead and arsenic.

Mercury

Mercury residues were sought in twenty samples of apples, three samples of pears, eight samples of tomatoes, five samples of eggs, and in eleven samples of cheese. Eleven of these samples showed the presence of small residues of mercury compounds but none exceeded 0·04 part per million. The residues were found in five samples of apples, one of pears, two of tomatoes, two of eggs and in one of the cheese samples. The mercury content of fresh fish is mentioned in the part of the report which deals with fish products. The average mercury content of canned tuna (thirty-two samples) was 0·27 part per million while that of all the other canned fish together (eighty-six samples) was 0·09 part per million.

Orthophenyl-phenol and Diphenyl

These fungicides are permitted for use within prescribed limits on certain fruits. The Preservative Regulations of 1962 prescribe the following limits for orthophenyl-phenol:— Apples, pears and pineapples, 10 parts per million; peaches 20 parts per million; citrus fruits 70 parts per million. In citrus fruits only, diphenyl may be used up to a limit of 100 parts per million.

No orthophenyl-phenol was found on apples, pears or on peaches, but traces (of the order of 5 parts per million) were found on a few samples of citrus fruit submitted under the Imported Food Regulations. Diphenyl was the favoured fungicide on those and it occurred in six of the twenty samples of citrus fruit examined. In only two instances (both samples of oranges) was the quantity found to be significant, the amounts in those cases being 52 parts per million and 45 parts per million respectively.

Thiabendazole

Towards the end of the year citrus fruit started to be imported at Heysham, and samples were submitted to the laboratory under the Imported Food Regulations. From information on some of the boxes it seemed that another fungicide, Thiabendazole, was being used upon them, so routine examinations for this compound were undertaken. Of four samples of citrus fruit submitted in December, a grapefruit sample contained 1.6 parts per million and two orange samples contained 3.3 and 2.4 parts per million respectively.

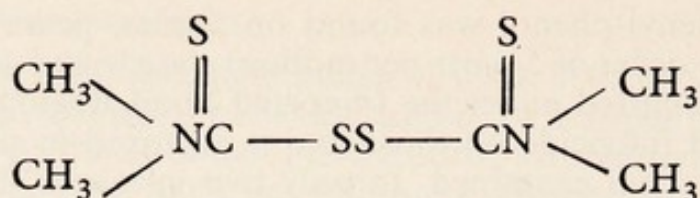
In the past, the laboratory has been inclined to look upon Thiabendazole solely as being an agricultural residue, but in 1972 the Food Additives and Contaminants Committee Report on the Review of the Preservatives in Food Regulations, stated that Thiabendazole should be looked upon as being a preservative, and they recommended a limit of six parts per million (calculated on the whole fruit) for citrus fruit. They were also prepared to accept its use on banana skins. There is a curious provision in Regulation 8 (5) of the Preservatives in Food Regulations, 1962, which permits the presence of non-permitted preservatives in food when their presence is due to protective measures taken when the food is in storage. It also allows permitted preservative under the same circumstances in non scheduled foods, but it does not allow permitted preservative in excess amounts in scheduled foods. This has usually been regarded as a provision for the use of methyl bromide or sulphur dioxide fumigant gases. The result of the Committee's decision to classify the material thiabendazole, as a preservative will be that a proportional addition of Thiabendazole, Orthophenyl-phenol and Diphenyl will have to come to no more than one hundred per cent of the total permitted tolerance for preservative on fruit.

Thiourea

This is a prohibited mould inhibitor which was formerly used on the peel of oranges to keep them sound during transport. None of the twenty samples examined for thiourea during 1972 had been treated with it.

Thiocarbamates

Thiocarbamates are mould inhibitors, and like Thiabendazole they have no established residue limits in this country, but residues of Thiram,



are sometimes encountered. Guidance can be taken from foreign practice, but the range one meets, varies from 0.3 parts per million in Germany and 3 parts per million in the Netherlands, to 7 parts per million which is considered to be the maximum likely under conditions of good agricultural practice in the United States of America. In Britain there has been some investigation which suggests that if 15 parts per million are on the leaves of lettuce at the time of harvest there will probably be little more than 5 parts remaining at the time of retail sale. Quantities in excess of 20 parts per million are regarded as resulting from practices which would not be good agricultural practice, and the food might therefore be justifiably thought to be food which should not be offered for sale.

Twenty-seven samples were tested for Thiram during the year, and nine of those had detectable residues remaining upon them. These were:—

Tomatoes	0.5 p.p.m.
Celery	1.5 p.p.m.
Lettuce	0.7, 0.8, 18, 36, 84 and 225 p.p.m.

The last three amounts found on lettuce were reported as being excessive. Whether the growers of the lettuces containing 36 p.p.m. and 84 p.p.m. were ever identified was not transmitted to the laboratory, but the grower of the lettuces which contained on average 225 p.p.m. of Thiram, was found to be an English one operating near Kingston-upon-Hull.

DRUGS

During the year under review there were 222 samples of drugs (138 from the County) submitted for chemical examination. This compares rather unfavourably with 314 such samples (243 from the County) submitted in 1971, and is only half the number submitted in 1970.

Part of the reduction in drug sampling is due to the apparent difficulty mentioned in previous years in inspectors obtaining drugs on prescriptions, and part was due to a virtual cessation of the sampling of drugs from clinics. However, there has been an increase in the number of drugs submitted as a result of complaints made by members of the public. There were ten such samples submitted in 1972. Three of the complaint samples carried declarations that Hexachlorophene was present and they still retained outdated recommendations for their use in children's ailments even after the Scowan Committee had advised in February that preparations containing

that material be used only on medical prescriptions where children were concerned. The determination of Hexachlorophene depends on a differential spectrophotometric assay which uses an acid solution and a buffered solution, the $\Delta E \frac{1\%}{1 \text{ cm}}$ at 312 m μ being 144. One of the samples which claimed to have Hexachlorophene in it (sample E655) gave a slight negative reading at 312 m μ , and the absence of Hexachlorophene was confirmed both by thin layer chromatography and by a colorimetric method using copper chloride in ammoniacal methyl alcohol solution. The manufacturer was advised to remove the references to Hexachlorophene from his labels. A second similar preparation was submitted because the purchaser thought the declaration stated 25 per cent Hexachlorophene instead of the 0.25 per cent which was actually present. It is a good example of how labels are sometimes designed to be misleading even when they are accurate. In this case the device had ceased to be an attractive deception with which to catch the "more-is better" brigade. Sample N5622 was a well known brand of antiseptic ointment containing Hexachlorophene, which bore advice for its use for Nappy Rash.

Forty two drugs were taken on prescription, these included analgesics, antibiotics, antidepressants, bronchial relaxants, diuretics and Sulphonamides. The only one of these which showed some irregularity was the Kaolin and Morphine mixture which is referred to in the table of unsatisfactory drugs.

The total number of drugs classified as unsatisfactory was 30.

The details are given in the following table:—

Table 31

Unsatisfactory Drugs 1972

Preparation	Sample No.	Irregularity	Observations
Cascara Extract Liquid	S.9500	Alcohol content 13·8% (B.P. limits 21–24%). Contained insoluble deposit. Old Stock.	Stock withdrawn.
Chelsea Pensioner Tablets	8903	Contained no honey as required by B.P.C. 1949 formula for Compound Confection of Guaiacum (Synonym: Chelsea Pensioner Confection).	Manufacturer communicated with.
Liquid Paraffin B.P. (complaint of burning sensation in mouth)	1631	Consisted of Light Liquid Paraffin B.P.C. Not intended for internal use.	Druggist cautioned.
Liver Salts (Complaint)	C.1747	Contained 200 parts per million of a light fuel oil.	Packers and Complainant informed.
Throat Preparation	091	Contained 0·41% Acetic Acid and 1·4% Alcohol compared with 2·2% Acetic Acid and 0·4% Alcohol, calculated from declaration.	Manufacturer communicated with.
Parrish's Chemical Food	S.9520	Iron and Calcium Phosphates precipitating out of Solution. Appearance of old stock.	Stock withdrawn.
Vitamin Capsules	88/72	Ambiguous designation of ingredients.	Labels amended.
Vitamin Syrup (Complaint)	386	Vitamin A content 2200 I.U. per 5 mls. Declared at 4000 I.U. per 5 mls. Appearance of old stock.	Stock withdrawn from sale.
Vitamin Syrup	387	Declaration of Vitamins should be in terms of fluid ounces or 100 mls.	
Vitamin Syrup	388	Declaration of Vitamins should be in terms of fluid ounces or 100 mls.	
Vitamin and Mineral Capsules	12314	Carotene 0·06 mgm per capsule (Declared at 0·344 mgm.) Zinc 0·28 mgm. per capsule (Declared at 0·5 mgm).	Manufacturer communicated with.

Table 31—continued

Preparation	Sample No.	Irregularity	Observations
Fever Mixture	8943	Contained 1·2 parts per million lead.	Manufacturer communicated with.
Cooling Powders	N.5100	Contained liquorice and Magnesium carbonate not declared in list of active ingredients.	Labels changed.
Antiseptic ointment	N.5622	Contained 0·05% Hexachlorophene but ointment recommended as being suitable for nappy rash.	Formulation revised.
Baby Powder (Complaint)	E.655	Label declared hexachlorophene (but none detected).	Labels amended.
Borax B.P.	C.2322	B.P. assay 106% (Limits 99–103%)	Stock withdrawn.
Borax B.P.	1704	B.P. assay 113% (Limits 99–103%)	Stock withdrawn.
Embrocation	324	Container not labelled in accordance with B.P.C. requirements. Should be dispensed in coloured fluted bottles and labelled "For external use only"	Stock replaced.
White Petroleum Jelly B.P. (Complaint)	E.9684	Contained 0·15% Thymol.	Section 2, Food and Drugs Act. £30 fine and £15 costs.
White Petroleum Jelly B.P.	E.9685	Contained 0·15% Thymol.	See E.9684
Rubbing Ointment (Complaint)	C.1746	Camphor 2·8% (Declared at 2·3%) Methyl Salicylate 2·8% (Declared at 2·3%).	Packers and Complainant informed.
Sulphur Ointment	713	Sulphur content 3·4% (Declared at 1·5%).	Manufacturer communicated with.
Talcum Powder	M.3	Contained 0·25% Hexachlorophene and recommended for baby use.	Labels amended.
Acetic Acid (Complaint)	E.662	Acetic Acid 24·8% w/w (B.P. 32·5–33·5%).	Complainant informed.
Dental Injection (Complaint)	C.1733	Slightly deficient in adrenaline. The clear glass phials were not suitable for prolonged storage.	Complainant informed. Stock replaced by amber coloured phials.
Vitaminised Slimming Tablets	12299	Declaration not in accordance with Regulation 24 of Labelling of Food Regulations, 1970.	Manufacturer informed.

Table 31—continued

Preparation	Sample No.	Irregularity	Observations
Compound Slimming Preparation	1742	Vitamin B1 Content of the Vitamin Capsules only 0.02 milligram per capsule as against 0.21 milligram declared.	Manufacturer agreed to amend labels.
Vitaminised Slimming Tablets	N.5434	Vitamin C content only 12 milligrams per tablet declared. Saccharin tablets had become powdered.	Stocks withdrawn.
Herbal Preparations			
Herbal Tablets	13244	Major ingredient was sodium bicarbonate.	Labels to be amended
Herbal Tablets	220/72	Hemp declared in list of ingredients but none found.	Labels amended.
Herbal Medicinal Essence	2/16	Contained undeclared food colourings.	Packers notified.
Drugs on Prescription Preparation			
Kaolin and Morphine Mixture (complaint)	S.9457	Contained a beetle larva of the family Ptinidae. Medicine only approx 62% in strength.	Dispenser interviewed. Complainant informed.

Ten medicinal items were also submitted among the samples submitted with Miscellaneous numbers attached to them. One was part of a tablet containing Benzocaine (Sample M853), one was a Tetracycline Syrup (sample M004), two were samples of vitamin tablets (sample M008 and M385), two were phenylmercuric nitrate solutions (samples M220 and M265), one was a hand cream said to contain hexachlorophene (sample M284), one was sodium bicarbonate (sample M155), one was a sample of propantheline tablets (sample M418) and the last was a sample of insulin (sample M552).

It is customary in these reports to add a few notes about individual samples and perhaps the most interesting ones are the following:—

Bendrofluazide Tablets (Sample number 8859)

These tablets were submitted as being a Vitamin B₁ tablet which was thought to have been wrongly prescribed, but a proprietary name was thought to have been associated with them. The statement made, was that the amount of Vitamin B₁ required, should have been that in a larger

tablet which can be supplied under the same brand name. What was found was that the brand name used was one which applied to a bendrofluazide tablet, a diuretic used in the treatment of oedema. That brand was available as a 2.5 milligram tablet and a 5 milligram tablet. The sample consisted of 5 milligram tablets of bendrofluazide.

Biostrath (Sample number 1688)

This product was discussed on pages 17 and 246 of the 1970 Annual Report, so it came as no surprise to learn that the television authority had decided not to accept its advertisement in 1972. A scrutiny of the claims made on the literature supplied with sample 1688 revealed that the word 'Tonic' had been deleted, so little remained for the laboratory to say about it.

White Petroleum Jelly B.P. (Samples E9684 and E9685)

White Petroleum Jelly is an official synonym for White Soft Paraffin B.P. for which the official description includes the words "odourless" and "almost tasteless". Sample E9648 was a sample submitted on complaint of its having caused a rash when applied to a baby's skin. It was immediately evident that there was something unofficial about it, since it had a faint 'medicinal' odour. On examination, the product was found to contain 0.01 per cent of Oil of Wintergreen and 0.15 per cent of Thymol, plus some other substance which never was identified. Because of the doubt in the analysts' minds about this other ingredient the only foreign material actually reported was the Thymol. Known side effects of Thymol include a tendency to produce rashes. The inspector had also brought an informal sample from the shop as sample E9685, and that was found to be similarly contaminated. The firm made contact with the laboratory, stating that it had taken possession of the five remaining jars in the shop, but that they had been unable to find any Thymol. County Laboratory explained that the estimate of the quantity present had been made by means of Gas-liquid chromatography, but that the presence of Thymol could be demonstrated by thin layer chromatography. It could be found by extracting it from a warm ether solution of the commodity by means of dilute caustic soda, which could be acidified to release it into dichloromethane. A concentrate of this, applied to a silica gel plate, could be developed with Xylene, and located with diazotised sulphanilic acid followed by caustic soda. Plate 32 shews the equivalence with a spot of Thymol. The inspector took the case to court, where the firm stated that it bought the petroleum jelly in 45 lb. drums, and those were found to be in order. They were warmed, and drained by means of a pipe system which was used for nothing else. They said they had taken five jars from stock and had found no Thymol. Fortunately the magistrates found in favour of Lancashire County Council even though the findings in connection with the second jar had not been raised, nor had it been said that the firm had agreed that methyl salicylate was present, and that the previous mix at the factory had included Thyme oil. It is a little hard on the firm to reflect that these small amounts of contaminant may have had nothing to do with the rash on the baby, but it does raise

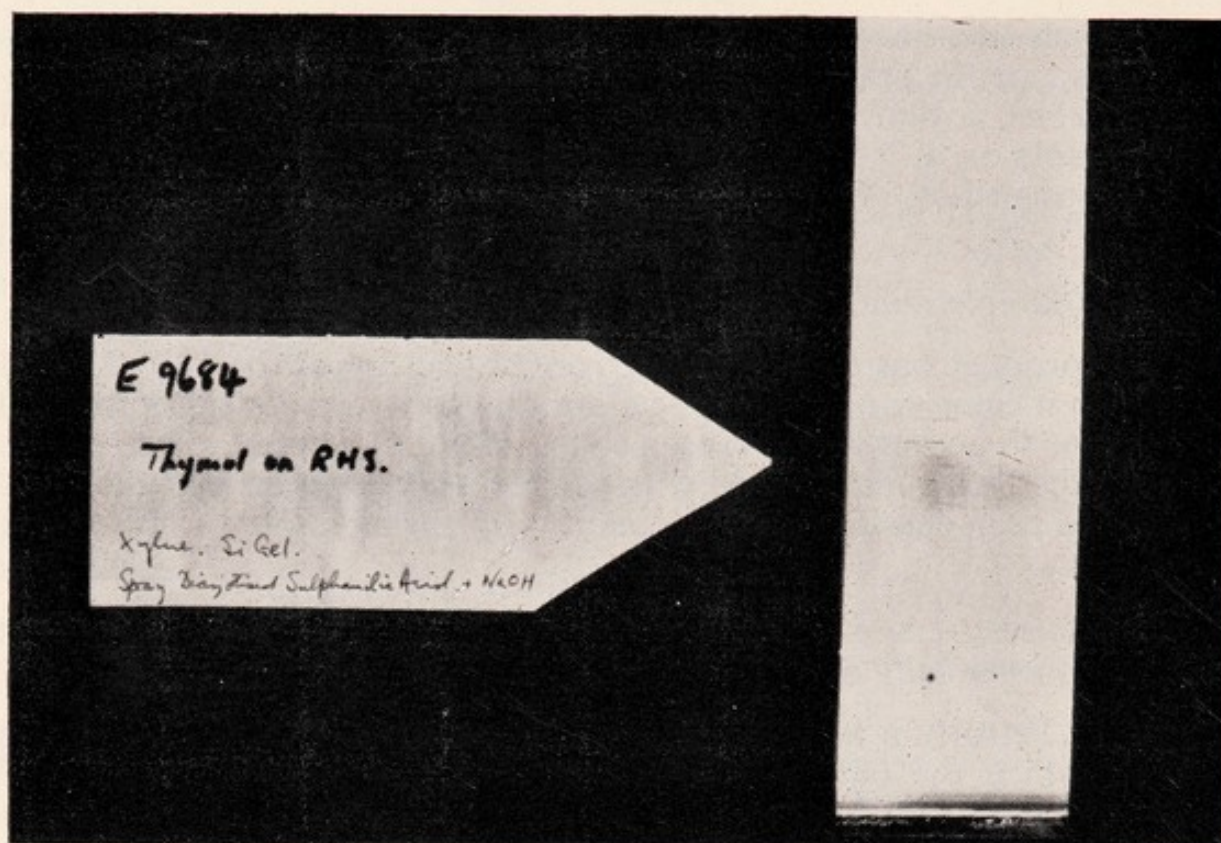


PLATE 32 TLC

an important pharmaceutical problem of cross contamination, mentioned in 1972 as a hazard, in a Pharmaceutical Society Conference at Keele University, and by Mr. A. E. Fishburn, Principal Inspector of the Medicines Inspectorate, in a talk given in Chester on the criteria on which Medicines Licences were granted. In consequence this was a much more important issue than it seemed.

Slimming Tablets for Men (sample N5433) and Children's Cooling Powders (sample N5100)

These samples are lumped together not for any analytical reason but because they were related in having had a similar comment made about them in answer to the laboratory's criticisms. The slimming tablets were criticised for not bearing the disclaimers required upon slimming preparations under the Labelling of Food Regulations. The cooling powders were criticised for having two undeclared ingredients which could be significant therapeutically when given to infants. One of those ingredients was liquorice, which had probably been added as a flavouring, but the other was magnesium carbonate, of which there were 30 milligrams present. The antacid dose of magnesium carbonate is 250 milligrams, but there is a rule-of-thumb method of arriving at children's doses which suggests that infants under one year of age should receive no more than a twelfth of the adult dose. Both firms replied that their products had been given Licences of Right under the Medicines Acts, and were therefore all right as they were. This of course is nonsense. Product Licences might

have some significance, but Licences of Right merely indicate that the material was being marketed in the year prior to the licencing requirements of the Medicines Act. There were other curiosities about both samples. The slimming tablets, which were made from one of the swelling cellulose derivatives, and were therefore intended to give a feeling of fullness in order to depress the appetite (a somewhat unscientific method since appetite is triggered by blood sugar levels), had a twin product marketed called 'Slimming Tablets for Women' which were of exactly the same composition. One up for Womens Lib! In the case of the cooling powders the correspondence became divided between the manufacturers who were anxious to label adequately, and the marketing division which wished to preserve the status quo. The ultimate correspondence shewed that the firm would include Magnesium Carbonate in the list of ingredients, but the marketing division also wanted equal rights with women by having the last word. They had taken advice from the Pharmaceutical Society, they said, and had been told that there was no need to include a statement of the presence of saccharin. It was the first mention that anybody had made of saccharin!

Phenyl Mercuric Nitrate Solution (samples M220 and M265)

If any reader of these notes is old enough to have read the story "Stalkey & Co.", he may remember that if anybody in that story was feeling below par, his condition was apt to be described as "suffering from leprosy and thrush". Thrush is a fungal growth of the mould *Candida albicans* which is very apt to infect human beings when bacteria, which seem to keep it at bay, are killed off. It is nowadays therefore inclined to be an iatrogenic disease resulting from irresponsible prescription of antibiotics. When women's magazines invade the precious realms normally inhabited by local government Health Education, they disturb the tranquil messages about cleaning teeth or washing hands, with startling stories about vaginal infections with Thrush, but it still most commonly is an infection of babies' throats, and although the whole civilised world is scared stiff about eating fish which contain mercury, the disease is normally controlled by means of Phenyl Mercuric nitrate solution. (Organic mercury, no less!) It would appear that the Pharmaceutical Society may have a point when it says that drugs dispensed from local authority clinics should be in the charge of qualified pharmacists. The clinic which dispensed a bottle of phenyl mercuric nitrate solution with which a mother was to treat her baby's Thrush fungus, evidently saw nothing odd about the solution containing growths of mould. The solution should have contained 33 parts per million of phenyl mercuric nitrate, but when it was submitted as sample M220 on 1 August 1972 it was found to contain only 0.1 part per million, and to be supporting actively growing colonies of penicillium moulds. On 6 September the mother telephoned the laboratory direct to say that she could scarcely recognise as her own beloved infant the fuzzy green thing to which she was still applying the solution. So the laboratory sent out messages of enquiry about what had happened to its certificate of analysis. Within five days it received another sample of phenyl mercuric nitrate solution, sample number M265, which also contained penicillium

mould growth and precious little else. If anybody knows the end of this story I will make space in the Annual Report for 1973 (if there is one) to let it be known that analyses really are performed for some purpose.

Vitamins

The confused situation which applied to vitamin preparations was relieved a little in 1972 by SI 1972 No. 1510, The Labelling of Food (Amendment) Regulations 1972. These totally replaced the baffling former Regulation 22 with a new form of words, which appears on page 4 of the Amendment regulations. Folic acid and Vitamin B₁₂ still do not appear in the Schedule, but the labelling situation for such preparations is now allowed for. Although, for the time being, the existing methods of declaring vitamins remain acceptable, the Amendment regulations also provide for future declarations of vitamin A to be in terms of micrograms of retinol, instead of International Units of Vitamin A (0.6 micrograms of beta carotene, or 0.3 micrograms of retinol, equalled one International Unit of Vitamin A). The Journal of the Science of Food and Agriculture for November 1972 stated on page 1389 that 1 i.u. retinol = 0.3 *gram* retinol when it strove to explain Metric Units, and this happy laissez-faire about a factor of a million will serve to introduce comment about sample N4895 Sylvasun Vitaminised tablets for protection against Sunburn. It was rather odd that these tablets should have appeared at the end of June, since the Pharmaceutical Journal had announced on 4 March 1972 page 206, that in Canada a ban had been placed on preparations containing more than 10,000 iu's of Vitamin A (unless supplied on prescription). The tablets claimed to contain 25,000 iu's of Vitamin A per tablet, along with 115 milligrams of chalk. In fact, it was found that they contained 22,000 international units. In the U.S.A. it was being said that excess vitamin A intake caused pressure inside the skull, which has a nice U.S. medical aspect of terror, but clearly the inspector who brought the sample was more concerned with the claims made, which were to the effect that a fortnight's course of these tablets would reduce the risk of soreness from over exposure to sunlight. Only two references to such a claim were unearthed, one in Med. Journal Australia Vol. 1. 1968 p802, and the other in Australian Journal of Dermatology 1969 p26. Both papers were written by R. E. Anderson, who said that seventeen-year-old boys who took massive doses of vitamin A shewed no greater resistance to sun scorch than boys who had been fed placebos. As, however, the laboratory had no animal experiment licence, no supply of bikini girls, and sunshine no greater than one gets on a grey June day on the roof of County Hall, it felt unable to comment on the claims in the light of the Trades Descriptions Act.

Vitamin preparations which received adverse comment in 1972 included the syrup preparations mentioned in the table—a series whose labelling might not have been questioned in the present state of the legislation had the first sample of it submitted, number 386, not been separating into an oily layer and a syrup layer—then there was a sample of children's vitamin drops, sample 1773, which were satisfactory, but bore an over-run date stamp; there was a sample of capsules, sample 12314,

in which the declared content of carotene was five times the amount present, and there were some Vitamin E capsules, sample 88/72, which had a list of ingredients which included a proprietary name which could not be identified as any particular ingredient. There were also some Slimming Biscuits, sample 2/49, which were low in their content of vitamin C and had a wrong declaration of calorie content. For future calculations, the Journal of the Science of Food and Agriculture, 1972 p1386, tells us that we shall have to multiply Joules by 4·184 to convert them to Calories (a typical piece of backwards-given information, since everybody will wish to convert Calories to Joules) and that for converting pounds to kilograms we must use the factor Pound = 0·45359237 Kg. ! Ah well—all that useless secondary-school education has to be employed somewhere, one supposes.

Herbal Preparations

The Annual Report can only give an outline of the samples analysed—the chemistry and individual reporting being more than enough to occupy NALGO's agreed hours of employment. The annual report itself, together with curious streams of enquiries, often account for so much additional time that one sometimes wishes that one had become employed in the Merchant Navy where due account is taken of the continuous nature of one's employment commitment. One of the correspondence phantom-extras of 1972 spilled over into other departments of the County Administration, and into several of the autonomous authorities as well, and there seemed to be nobody who had not been bombarded with mail from a retired gentleman who had a bee in his bonnet about non-herbal ingredients in herbal remedies. His correspondence led to the examination of a large number of preparations, and some firms were, in consequence, reminded that items like sodium bicarbonate, stearic acid, and coal tar colours which had been used in their preparations, were not compatible with statements like "100 per cent Herbal" which appeared on some labels. The complainant's correspondence stopped abruptly at mid-year and one wondered whether one might recite over it the epitaph for a self-assertive pedestrian. He was right, dead right as he toddled along . . . but he's just as dead now as if he'd been wrong!

Kaolin and Morphine Mixture (sample S9457) and Sex Tablets (sample M385)

The Kaolin and Morphine Mixture sample was a complaint from a person to whom the medicine had been dispensed, the complaint having been made because there was a larva of the family of beetles called Ptinidae in it. When analysed, the medicine itself was found to be under strength—a probable consequence of not shaking the stock bottle before the medicine was dispensed. It very likely *was* the fault of the pharmacist who dispensed it, and it is not beyond the bounds of possibility that carelessness in one direction could have been matched by carelessness in another, and that the supplier may well have supplied the medicine in an unwashed bottle containing a beetle larva. Had the Medicines Act been in force he would probably have been prosecuted. As it is, there is a legal decision (Appleby

v Sleep March 22.1968—see All England Law Reports 1968 (2) p265) in which it was held that dispensed medicines are the property of the National Health Service, and since the recipient had not technically bought the medicine there could be no sale to the prejudice of a purchaser on the grounds that the medicine was not of the substance demanded. The question of sale has bedevilled the Pharmacy Acts for many years, and the Medicines Act uses new phrases, of which "Supply in circumstances corresponding to retail sale" is one. Whether this would cover the situation in which pharmaceutical products are given away may still need to be decided in a test case, but an example of tablets having been obtained by those means seemed to be provided by the Sex Tablets (sample M385) which were said to have been a gift made to encourage purchases in a Sex Shop. They were chocolate coloured tablets 11/32" diameter and 7/32" thick, having a sugar and chocolate coating and a pale orange-coloured core. They were essentially a caffeine and vitamins tablet, having a content which included 35 milligrams of caffeine, 9.5 milligrams of Vitamin E, 6.5 milligrams of Nicotinic acid, 1 milligram of Riboflavine, and half a milligram of Thiamine, together with three and a half milligrams of iron (when expressed as the oxide). Absence of succinate showed that they were not Becovite, and they were not the BPC tablet Aneurine Co. Fort. So it was suggested that they might have been a foreign preparation. At that stage it was learned that they may in fact have been given away in Gothenburg. Nevertheless it did reveal an unsatisfactory situation. Tablets could be given away in Britain, with no disclosure of content, and without any control upon them under existing law.

Insulin (Sample E753 and M552)

There are certain areas of drugs examination which might be required under the Food and Drugs Act but which are not satisfactorily covered by laboratories equipped only to perform chemical analyses. Under EEC legislation too, bacteriological examinations will need to be performed and the results may need to be certified. One form of testing which no public analyst is equipped to perform is the biological testing done by means of animals as test reagents rather than chemicals. The potency of insulin can only be assessed in that way. Section 92(4) of the Food and Drugs Act authorises a public analyst to pass a sample he is unable to analyse along to another public analyst, but no provision is made for passing it to any other analyst. County Laboratory was not able, therefore, to deal with a specimen of outdated insulin which was submitted to it. In the course of rummaging around with this sample, it was discovered that there was just a possibility that the lady who had complained may in fact have retained the material for a year in her own refrigerator, and the news meant that no one could reasonably be involved in prosecution. It meant that the matter could be dealt with informally, and one of the four commercial laboratories which do this kind of testing in Britain could be approached. Since the material had been made by the Wellcome Laboratories, they were asked to test it, and they did it by the mouse convulsion method. Although the preparation bore an expiry date of almost a year previously, it still showed about 90 per cent potency, so there had been no

hazard. Nevertheless, Mr. K. Reeve at the Department of Health and Social Security, 33/37 Finsbury Square, London EC2A 1PP who administers the Therapeutic Substances Act, was notified, so that the matter could be properly checked.

Sodium Bicarbonate (Sample M155)

Far from being the relatively simple item its composition might lead one to suppose, this sample proved to be very time consuming, since it carried overtones of the Misuse of Drugs Act about it. It was a white powder submitted for analysis after it had been found in the possession of someone at one of H.M. Prisons, and it was the possibility of its being a support for some other drug which caused so much time to be spent upon it. As it happened the poser consisted of nothing but bicarbonate of soda. This, too, raises an interesting aside. Until the present time, public analysts have been allowed possession of dangerous drugs to cover such eventualities as a need for authentic specimens. A notice in *Chemistry in Britain*—November 1972 p505 suggested that they would need to register specially—but the Home Office (01 799 3488 Ext 504) says that it will depend on what appears in regulations not yet made. It is very likely, however, that even Public Analysts will not be permitted to hold Schedule 4, hallucinogenic, drugs, (like L.S.D.) except under the terms of a licence applied-for when the need for such a chemical arises, and on condition that any unused chemical is destroyed in the presence of a 'responsible person'.

PROSECUTIONS

Tables 32 and 33 show County Fines and Costs since 1937, and the Fines and Costs of all prosecutions taken with the department's aid in 1972, showing too, where they were imposed. In order to make current fines comparable with those of previous years, the last column of table 32 is adjusted to show all the past monies in terms of today's values; but it is a poor approximation. The major problem is that there is not, at the time of writing this report, an official Consumer Price Index available for the year 1972. In past years, a close approximation to the change in money values has been achieved by using the table in Whitaker's Almanack, and increasing the last figure in that table in the same proportion as the proportional change in the Consumer Price Index for the year indicated there and the year under review. At least in the past the *Department of Employment Gazette* has managed by March to produce a figure for the overall year preceeding the year of this report, but in 1973 it has proved necessary to assess the index both for 1971 and for 1972. The figure used for 1971, therefore, is half the sum of the January and December index for that year, and that used for 1972 is the average of the sum of the published indices for all twelve months. The price index (based on 1963 = 100) published in Whitaker for 1971 as being 144, had then been increased in the ratio 164:152 to produce a figure of 156. If this juggling is as successful as it has been in past years it will be within 1 of the next figure to be published in Whitaker. Not even Whitaker seems able to do better than that. In the last three issues it has quoted both 126 and 127 as the index for the year 1969. The resulting comparisons are nonsense, however. Any English holidaymaker will remember the hand painted boards at wayside stalls which in 1937 used to say "Lettuces 1d" and people in those days would have been horrified at the idea of a shilling apple. The difference in money values between 1937 and 1973 is probably nearer to 18 times than the five times shown in the table.

However, the final column of Table 32, whose initial intention had been to shew that events had not changed a great deal since Lancashire's laboratory came to Preston, now seems to indicate quite the opposite.

Table 32
County Fines and Costs 1937-1972

Year	No. of Convictions or Orders to Pay Costs	Dismissals, etc.	Fines and Costs £	Present Value £
1937	36	3	165	810
1938	24	2	132	639
1939	18	1	101	477
1940	23	2	172	604
1941	79	5	825	2,995
1942	36	2	502	1,825
1943	49	5	376	1,080
1944	37	1	292	835
1945	33	0	365	1,046
1946	92	2	936	2,690
1947	93	5	667	1,790
1948	69	1	703	1,755
1949	45	3	519	1,264
1950	42	1	405	960
1951	39	11	363	790
1952	64	1	621	1,273
1953	53	1	577	1,162
1954	45	0	294	581
1955	41	1	261	500
1956	19	1	186	342
1957	18	3	371	658
1958	26	1	270	467
1959	17	0	280	481
1960	16	0	233	396
1961	30	0	350	580
1962	32	0	363	575
1963	28	0	495	780
1964	32	0	474	719
1965	33	0	656	950
1966	44	0	930	1,299
1967	33	1	887	1,203
1968	40	0	1,267	1,650
1969	45	3	1,856	2,284
1970	53	2	2,953	3,475
1971	49	0	1,693	1,823
1972	52	2	2,208	2,208

Table 33

District Distribution of Prosecutions arising out of Samples obtained in 1972

District	Number of Prosecutions	Convicted or Ordered to Pay Costs	Dismissals, etc.	Fines and Costs £ p
Atherton U.D.C.	2	2	—	131·30
Burnley R.D.C.	1	1	—	65·00
Chadderton	1	1	—	69·50
Clitheroe Borough	2	2	—	61·00
Colne Borough	5	5	—	139·00
Crompton U.D.C.	1	1	—	45·00
Denton U.D.C.	2	2	—	166·00
Fleetwood Borough	2	2	—	58·00
Fulwood U.D.C.	1	1	—	113·00
Garstang R.D.C.	1	1	—	35·00
Golborne U.D.C.	2	2	—	63·50
Haslingden Borough	1	1	—	20·00
Heywood Borough	1	1	—	45·00
Hindley U.D.C.	2	2	—	54·00
Horwich U.D.C.	1	1	—	38·00
Litherland U.D.C.	2	2	—	73·00
Lunesdale R.D.C.	1	1	—	20·00
Lytham St. Annes Borough	3	3	—	112·00
Mossley Borough	2	2	—	41·00
Nelson Borough	3	1	2	68·00
Ormskirk U.D.C.	2	2	—	101·00
Prescot U.D.C.	1	1	—	33·00
Prestwich Borough	1	1	—	13·00
Radcliffe Borough	3	3	—	124·00
Royton U.D.C.	1	1	—	68·00
Standish U.D.C.	1	1	—	103·50
Tottington U.D.C.	1	1	—	38·00
Warrington R.D.C.	1	1	—	38·50
Westhoughton U.D.C.	1	1	—	38·00
Whiston R.D.C.	4	4	—	112·50
Wigan R.D.C.	1	1	—	53·50
County Districts	53	51	2	2,140·30
Autonomous Authorities ...	22	22	—	773·55
Other than Food and Drugs	3	2	1	78·00
Total (All Sources)	78	75	3	2,991·85



Three further cases heard in 1973

Cty F & D	1	1	—	68·30
Auton F & D	1	1	—	45·55
Other	1	1	—	35·00

PART II

THE FERTILISERS AND FEEDING STUFFS ACT, 1926

The Fertilisers and Feeding Stuffs Act 1926 came into force on 1st July, 1926. Its purpose was to safeguard purchasers of animal foods and of soil nutrients from fraud, or from misdescription of goods which are practically the raw materials of the agriculture industry. One reason why Analyst Department costs never appear to be very commercial is that the departments are often tied to standard methods of analysis. The Fertilisers and Feeding Stuffs Regulations, 1968, consist, in the main, of schedules which say how Fertilisers or Feeding Stuffs should be marked, how they should be sampled, what nutrients they should contain, the methods of analysis by which they should be checked, the tolerances to be allowed and the methods of reporting.

The regulations under the Act are complex, so that instead of *new* regulations having been issued to bring in the provisions of Part IV of the Agriculture Act, as had confidently been expected by now, the old regulations of 1968 which have stood the test of time, have continued in force while the complications of dovetailing legislation with that of the EEC have been being resolved.

Those complications seem to involve separate control of Fertilisers, and of Feeding Stuffs, and of Medicinal substances added to feeding stuffs. As 1st July, 1973 is the date upon which the EEC Directives are meant to be implemented, it can be presumed that 1972 was the last whole year in which the regulations which enforce the 1926 Act will have operated.

In total there were fifty samples of fertilisers examined in 1972, of which only twelve were taken formally, (Nineteen were County samples, eight being formal ones). Of that total, thirty-four samples were correct, and seven had differences so small that no purchaser was likely to be prejudiced. There were two samples which were not strictly fertilisers, one being a seaweed preparation having nutrient levels too low to need declaration, and the other was a Foliar Feed, which is outside the definition "fertiliser of the soil" mentioned in Section 1 of the Act. Its nutrients were, however, correctly declared. Four samples showed small labelling errors. Two informal samples showed relatively small deficiencies about which the question of prejudice turned on how large a quantity was involved in the purchase. In one case the fertiliser was a small bottled product for use on pot plants, and in the other case the sample was an informal sample of bone meal which contained slightly less than the declared amount of phosphoric acid. It proved to have been taken from one package available at a time when bonemeal was in short supply. An explanation for the shortage was that a Swedish Health-faddist had advocated feeding bone meal to children in order to improve their teeth, and the Swedish demand for bone meal, through their pharmacies, had, in combination with a dock strike, left Britain with very small supplies of that particular fertiliser. One sample, sample 15/7/A was sold to the prejudice of the purchaser. That was a Nitro-potash fertiliser which was found to be 8.55 per cent

deficient of potash. The circumstances of the sale were peculiar. It was in a heap in a shed—exposed for sale but unmarked. The vendor had said: “Oh—that’s twenty-six nought two”, but in his office he had picked up a certificate of analysis from a consultant analyst which said that it contained 24·8 per cent nitrogen and eleven per cent potash, and he altered the declaration. The County analysis agreed with the first declaration . . . namely, twenty-six per cent nitrogen and two per cent potash. The inspector’s first worry was whether the sample should have been taken. Section 4 of the Act speaks of fertiliser being “marked in the prescribed manner”, and the prescribed manner of marking did not appear to deal with bulk. A Ministry opinion, however, ruled that the dictionary definition of ‘parcel’ (the word used in the Act) included “quantity” . . . and that a heap in a particular shed amounted in itself to its being marked, since Regulation 6 of the 1968 Regulations uses the words, “or in any other appropriate manner”. That disposed of the possibility that the offence had been one of ‘not marking’. In the meanwhile, the vendor had produced a statement saying that the material had been sold to only one customer, and that he had purchased it on its nitrogen declaration only, and so was not prejudiced. Thus, the only prejudiced customer was the inspector, who had originally been given the correct declaration. This raised a question of whether Section 20 of the Act, which uses the words “*causing* any particulars to be false” implied that a case could be brought against the consultant analyst . . . since in the meanwhile the consultant analyst had apologised for issuing a wrong certificate. Oddly enough, “causing particulars to be false” is nowhere in the Act specifically made an offence. This left the vendor with a defence under Section 8(2) which uses the words, “unless he proves that he took all reasonable steps to avoid committing the offence and that he acted without intent to defraud”.

Your analyst was caught-out with one fertiliser sample, declared at Nitrogen 14·5%, Soluble Phosphoric acid 5·1%, Insoluble Phosphoric Acid 0·3%, Potash 6%. The analysis showed Nitrogen 14·5%, Soluble Phosphoric Acid 5·7%, Insoluble Phosphoric Acid 0·4%, Potash 6·75%. All of which are within the permitted tolerances. The Amendment Regulations SI 1970 No. 328 on page 11 however, add the provision “where the total of amounts stated is 25% or over, the amount of all variations taken together after setting off deficiencies against excesses shall not exceed 1/20th of the aforesaid total”—and the Ministry was a little upset that the sum of all the declarations of nutrients (namely 25·9%) provided an overall tolerance of only 1·29%. The sum of all the analytical figures exceeded this by 0·16 per cent and the error had been overlooked.

The protein shortages of 1972 made some of the microscopical examinations of feeding stuffs appear unusual, to say the least. Fish-meal and soya meal appeared to have been much less in use than normally, and seeds like sunflower seed were found in pig meals, where normally it is seldom, if ever, found. Sunflower seed is difficult to handle, and it is normally considered a source of methionine, which is not essential to pigs. This kind of odd formulation may in fact have been a fore-taste of Common Market compounding, which is said to differ from traditional British compounding. Another indication of change was that rapeseed

meal became more common. During the war, rapeseed was considered to be an undesirable seed for pigs, in particular, to eat, but it seldom appeared in *any* feed. In 1972 small quantities seemed to turn up in almost every kind of feed.

There were fifty-seven samples of feeding stuffs examined, of which forty-four were taken formally. (Thirty-four were County samples, all having been taken formally, one being an Official Sampler's sample).

Thirty-four samples were correct, and eight more showed variations so small that no prejudice was considered to have been involved. There were a few examples of how confusing the labelling requirements can be. In one case a drug additive was stated to be present in the quantity "13 ounces of Zoalene per ton", but the coccidiostat included in Zoalene is Dinitolmide. The amount of Dinitolmide present was 3.7 ounces per ton, which was in accordance with the recommendations in the MAFF leaflet "Zoamix (Veterinary Use) D590 4/1/1251 500 12/65 TXL".

A letter from the Ministry dated 5th December 1969 and bearing the reference 5266B, requires the drug to be declared as 'Dinitolmide', and SI 1968 No. 883 requires it to be declared in terms of parts per million. In another sample the drug Quinoxaline had been wrongly named.

In a sample of Pig-creep pellets there was an unsatisfactory declaration "40 grams Zinc Bacitracin" with no statement of the quantity of the feed which might be expected to contain this amount. On analysis it was shown that no zinc bacitracin was present. Although this is really a matter to be dealt with by the Therapeutic Substances Act, attention was drawn to it. The vendor was able to show that it was a declaration on a single bag which had been used among many others which were correctly used for the commodity, and he stated that no zinc bacitracin was in use.

Another unsatisfactory declaration occurred with a sample of White Fishmeal, which bore a statement "Oil (max) 6%". In fact, the second footnote at the end of Part II of the first schedule substituted for Schedule I to the Act requires the *actual* amount of oil to be stated. The amount actually present was 3.9 per cent.

Attention was drawn, with two samples, to slight excesses of copper and to one of arsenic, and, in yet another sample to a wrong declaration of Urea, this being a sample of Dairy Nuts. This nitrogenous supplement is required to be declared as "Protein Equivalent of Urea", but the urea had been declared only as urea, so that the ingredient was stated in terms 2.9 times smaller that it should have been. In a sample of Feeding Nuts this same error of labelling had made the declaration of total protein wrong. A small urea contamination was found in another feeding stuff to which it had not intentionally been added.

In only two instances were feeding stuffs reported as being to the prejudice of the purchaser. The extraordinary rigmarole of getting a case to court was described in the Annual Report for the year 1970 . . . so no

case reaches court until all possible loose ends have been tidied up. Despite that, in the case of sample 49/2/A, the magistrates decided that the firm had taken all reasonable precautions to prevent the occurrence, and they dismissed the case. (They did add, however, that the case was a proper one to have been brought). The magistrates who heard the other case, sample F219A, found the case proved, but they were guided by the Clerk of the Court who said that there was a fixed penalty of £5. In fact the fixed penalty of £5 only applies to 'failing to give any statutory statement'. The penalties in Section 19, namely liability to a £20 fine for a first offence, or a £50 fine for a second offence, ought to apply to mis-statement in statutory statements, but a £5 fine was all that the magistrates imposed.

Section 18 of the Act requires that each enforcing authority shall make a quarterly return to the Ministry of the results of all the analyses of samples examined under the Act. For this reason they are presented in their bewildering complicatedness each quarter in order to allow Council Members to see what is being forwarded in their name. Since few members ever really do see them, they are presented again in tables 34 and 35.

Table 34
The Composition of Fertilisers 1972

Sample Number, District and Description	Formal or Informal	Per cent Nitrogen		PER CENT PHOSPHORIC ACID (P ₂ O ₅)								Per cent Potash K ₂ O		Other Figs. per cent
				Total		Soluble		Insoluble		Soluble in Citric Acid				
		G	F	G	F	G	F	G	F	G	F	G	F	
4/8/B Rochdale Sangral	I	14.5	14.5		6.1	5.1	5.7	0.3	0.4			6.0	6.75	A B C
5/8/B Rochdale Topglass Liquid Fertiliser	I	5.0	5.1		4.3	5.0	4.3		Nil			8.0	8.4	
5/11/B Widnes Sangral, 9-5-4	I	9.0	9.0			5.0	4.8					4.0	3.7	
1 Lonsdale I.C.I. Nitro Chalk	F	25.0	24.8											
19/2/B Lonsdale Bio Plant Food	I	5.2	5.4		5.2	5.2	5.2					6.0	6.4	D
49/6/A Leyland Horticultural Steamed Bone Meal	F	1.5	1.3	30.0	30.1									
5/6/B Leyland Bone Meal	F	3.5	3.6	18.5	16.2									
18/10/A Seaforth Vitax Q4	F	5.3	4.9		7.7	6.8	7.2	0.7	0.5			10.0	10.8	
19/10/A Seaforth Vitop No. 3 Top Dressing	F	13.0	12.7		0.4								0.2	E
12/7/B Bury Garden Plus	I	5.1	5.25		6.8	5.75	5.3	1.0	1.5			8.1	7.4	
13/7/B Bury Hydrated Lime	I													
17/2/B Lonsdale P.b.i. Autumn Toplawn	I	3.0	3.4		8.50	4.0	4.05	4.0	4.45			4.0	4.3	
18/2/B Lonsdale Eclipse Plant Food	I	6.0	6.3	6.0	6.0	4.5	3.5	1.5	2.6			6.0	5.6	H
11/7/B Bury "—" Growmore	I	7.0	7.2		6.9	6.0	6.1	1.0	0.8			7.0	7.5	
15/7/A Bury Nitro Potash	F	24.86	24.3		0.09							11.05	2.5	
15/4/B Lower Blackburn Plant Food	I	5.2	5.2		5.3	5.2	5.3					6.0	6.5	
16/4/B Lower Blackburn Rose Fertiliser	I	5.0	5.1		14.9	5.0	5.1	5.0	9.8			10.0	10.7	J
20/10/A Seaforth "—" Manure	F	3.0	3.5		6.2	4.0	4.7	2.0	1.5			12.5	13.8	K
21/10/A Seaforth "—" Fertiliser	F	5.2	4.7		10.2	7.2	7.9		2.3			9.7	9.1	

A. Found—Magnesium 730 p.p.m.

B.	Boron p.p.m.		Cobalt p.p.m.		Copper p.p.m.		Iron p.p.m.		Magnesium p.p.m.		Manganese p.p.m.		Molybdenum p.p.m.	
	G	F	G	F	G	F	G	F	G	F	G	F	G	F
	5	4.4	5	4	11	9.7	5	28	54	60	9	7	5	3.1

Table 34—continued

C. Found Neutralising Value as CaO 12.9%.

D.	Magnesium %		Iron %		Manganese p.p.m.		Copper p.p.m.		Boron p.p.m.		Molybdenum p.p.m.	
	G	F	G	F	G	F	G	F	G	F	G	F
	1.75	1.98	0.39	0.47	145	124	40	35	40	37	1	0.8

E. Neutralising Value (Calcium Oxide)—Guaranteed 70.0%, Found 73.7%; Magnesium—Found 0.18%.

H. Found Rotenone 0.16%, Found Quintozene 1.0%.

I. Guaranteed Nutrients equivalent to 6, 6, 7 w/v.
Found Nutrients equivalent to 6.1, 6.2, 7.7 w/v.

J. Guaranteed Iron 1%, Magnesium 0.5%.
Found Iron 0.8%, Magnesium 0.65%.

K.	Magnesium %		Iron %		Manganese p.p.m.		Copper p.p.m.		Boron p.p.m.		Molybdenum p.p.m.	
Guaranteed—	1.50		0.6		250		350		25		4.6	
Found—	1.88		0.92		190		120		25		4.6	

Table 35 — continued

Sample Number, District and Description	For- mal or Infor- mal	Per cent Oil		Per cent Protein		Per cent Fibre		Per cent. Protein equivalent of Urea		Per cent Magnesium		Parts per million Copper		Parts per million Nitrofurazone		Parts per million Furazolidone		Parts per million Arsenic		Other Figs.
		G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	
38/3/A Kirkham Growers Mash	F	3.0	3.7	16.5	16.25	5.0	5.6		Nil		0.22		14		Nil			Nil		B
2 Higher Blackburn Intensive Layers Meal	F	2.75	2.5	15.5	14.1	4.0	2.2		Nil		0.1		15		Nil			Nil		
3 Higher Blackburn Sow and Weaner	F	2.5	3.0	16.0	16.7	6.0	5.5		Nil		0.2		32		Nil			Nil		
39/11/A Widnes Feeding Meat and Bone Meal	F	4.0	4.7	50.0	49.1															C
16/10/A Seaforth Startrite Pig Booster	F	2.5	3.3	16.0	16.8	4.5	4.55		Nil		0.19	125	135		Nil					
17/10/A Seaforth Battery Mash	F	2.9	2.8	15.5	14.7	4.5	3.0		Nil		0.13		9.5		Nil			0.6		
36/4/A Lower Blackburn Chick Rearing Mash V.A.	F	3.0	3.2	18.0	16.9	4.0	4.4		Nil		0.15		15		Nil			0.5		D
37/4/A Lower Blackburn Pig Growers Meal	F	3.5	3.15	17.0	16.1	4.5	4.6		Nil		0.14	180	158		Nil					E
48/12/A Warrington Chick Starter Mash V.A.	F	3.5	3.3	18.5	19.3	5.0	3.5		Nil		0.17		24		Nil			0.6		
49/12/A Warrington Beef Concentrate, V.A.	F	3.0	3.6	36.0	32.4	4.5	3.7		Nil		0.18		95		Nil			2.6		
45/9/A Manchester Medium Hybrid Mash	F	3.5	4.45	16.0	16.3	5.0	3.8		Nil		0.19		10		Nil					
46/9/A Manchester Intensive Growers Mash	F	3.0	3.6	15.5	15.4	5.0	4.5		Nil		0.16		16		Nil					
39/3/A Kirkham Sow and Weaner Meal	F	2.0	2.6	15.0	15.7	6.25	5.5		Nil		0.2		85					Nil		H

Table 35 — continued

Sample Number, District and Description	For- mal or Infor- mal	Per cent Oil		Per cent Protein		Per cent Fibre		Per cent. Protein equivalent of Urea		Per cent Magnesium		Parts per million Copper		Parts per million Nitrofurazone		Parts per million Furazolidone		Parts per million Arsenic		Other Figs.
		G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	
4 Higher Blackburn Pig Meal	F	2.25	2.8	14.0	13.6	8.0	7.7		0.2		0.2	175	120		Nil		Nil		Nil	
5 Higher Blackburn Layers Mash	F	3.0	3.6	15.0	13.9	6.0	6.4		Nil		0.17		18		Nil		Nil		Nil	
40/3/A Kirkham Medium Hybrid Layers Meal	F	2.75	3.1	15.5	14.7	4.5	3.3		Nil		0.16		18		Nil		Nil		0.2	
41/3/A Kirkham Pig Breeders Meal	F	2.75	3.05	16.0	16.0	5.0	4.3		Nil		0.18		16		Nil		Nil		0.2	
1/6/A Leyland Turkey Fattening Pellets	F	2.5	3.6	15.0	15.7	4.5	3.5		Nil		0.18		10		Nil		Nil			I
2/6/A Leyland Super Toplean Meal	F	2.5	2.2	15.0	14.8	5.5	4.1		Nil		0.18	190	160		Nil		Nil		0.2	
1/12/A Warrington Pig Fattening Meal	F	2.0	2.7	13.0	14.0	5.5	4.6		Nil		0.18		11		Nil		Nil			
2/12/A Warrington Sow and Weaners Meal	F	2.5	3.0	15.0	15.0	6.0	4.5		Nil		0.23		11		Nil		Nil			

A Salt—Guaranteed 2.0%, Found 1.3%
Phosphoric Acid (P_2O_5)—Guaranteed 8.0%, Found 8.5%.

B Dinitolmide—Found 104 p.p.m.

C Salt—Found 1.4%
Phosphoric Acid (P_2O_5)—Guaranteed 10.5%, Found 9.6%.

D Amprolium Sulphaquinoxaline Ethopabate
p.p.m. F G p.p.m. F G p.p.m. F
52.0 65 39 33 3.2 2.8

E Quindoxin—Guaranteed 50 p.p.m., Found 54 p.p.m.

H Found Sand and other silicious matter 0.2%
Found Castor Seed—Nil

I Guaranteed to contain 125 p.p.m. Dimetridazole.
Found 130 p.p.m. Dimetridazole.

Vitamin A—Found 600 I.U./100 g.

PART III
WATERS, EFFLUENTS, ETC.
DRINKING WATERS

Two hundred and twenty-seven samples of potable waters were examined during 1972. Only two this year were taken at dairies. This total compares with one hundred and eighteen potable water samples examined during 1971 and it is the highest total since 1968. One sample was submitted for hardness only; sixty-six were examined for metal content, and three were examined for their nitrate content. One was submitted as a water deposit, one was submitted as a check sample in which presumptive coliform organisms were suspected of being present. One was taken from a vending machine in connection with an occurrence of illness. Two samples were taken from drinking water heaters. One sample was taken to assess its suitability for cattle to drink and another one was taken from a contaminated watering trough at a farm. The remaining one hundred and fifty samples were submitted in order to confirm their suitability for drinking or domestic purposes. The results are classified in the following table, according to source and purity.

Table 36
Waters 1972

Source					Fit	Doubtful	Unfit	Total
Deep Well	...	...	...	...	20	1	0	21
Shallow Well	...	...	...	...	2	9	1	12
Spring	...	...	...	...	8	9	0	17
Upland Surface	...	...	...	...	64	18	1	83
Upland Surface Mixed	...	...	...	...	15	2	0	17
Totals					109	39	2	150

One hundred and nineteen of the samples listed in the above table were taken either from public supplies or from raw water sources which were intended for public supply. There were twenty Deep-well waters, two Shallow-well waters, two Spring waters, Seventy-eight Upland-surface waters and seventeen mixed waters from Upland Surface gathering grounds and other sources.

Thirteen of the waters listed in the table contained faint traces of nitrites. The presence of nitrites can sometimes be an indication of pollution, but it can also arise from the metallic reduction of nitrates

which may be naturally present in the water, as it stands in metal supply pipes. Special consideration of bacteriological reports was recommended for twelve of the waters which contained nitrites. The remaining water was from a supply which almost always contains nitrites without containing bacteria and it was considered to be of sufficient chemical purity.

Extra bacteriological investigation was recommended for twenty-six waters which had other suspicious features such as high nitrate content, high chlorides or high presumptive coliform counts. All of these can, in appropriate circumstances, be indications of past or present pollution.

Only two waters were classified as "Polluted" during 1972. One of these was taken from a private well where a bacteriological sample, taken eight days earlier, had been reported as being satisfactory. In this case the specimen taken for chemical testing shewed a high ratio of free to albuminoid ammonia, relatively high nitrate and chloride contents, a high presumptive coliform count, and the presence of nitrites. (W546).

The other water had been derived from a private spring at premises where there was no other water supply, and it had a high presumptive coliform count. It was therefore recommended that water from that supply should always be boiled before use (W596).

Another similar private supply with a high bacteriological count was reported as being unlikely ever to be fit for drinking purposes, although additional bacteriological checks were recommended in order to discover whether any of the bacteria present actually were of faecal origin. (W640)

A sample of well water and one of nearby pond water were suspected of being contaminated by run off water from a nearby newly constructed motorway. Analysis of the well and pond waters showed that the small amount of contamination the well was receiving was being derived from some other source. Both waters were tested for the presence of hydrocarbon oils and bitumen, but they were found to be free from these contaminants (W516).

Two further samples from the well were analysed after periods of heavy rain. Those analyses confirmed the original opinions that motorway run off was not involved in the contamination of the supply (W520/21).

Two waters intended to be used on farms were found to be suitable for stock watering, although in one case the analysis of the alleged alternative water was almost identical with that of tap water submitted from the same farm (W441 and W435).

Twenty-seven samples were submitted as a result of complaints. Eleven of these were said to have involved illness, ten involved complaints of peculiar tastes, and the remaining six were associated with complaints about discoloration or deposit formation. The sample actually submitted for analysis of the water deposit it contained, had living matter, namely iron bacteria and the protozoa *Euglena* and *Paramecium*, in it. Analysis

of the deposit revealed that it had the following composition:— aluminium hydroxide 65 per cent, silica 7 per cent, iron hydroxide 5 per cent and organic matter 23 per cent. It was therefore typical back-wash material from treatment plant water filters.

One hundred and fifty-three samples were tested for the presence of free chlorine used as a water sterilant, and it was found in sixty of them. The mean of the amounts found was 0·02 parts per million, the highest amount found being 0·27 parts per million. (The corresponding amounts found in 1971 were 0·03 parts per million and 0·13 parts per million respectively).

Sixteen of the water samples were examined for fluoride content. The amounts found were all typical of the amounts natural to waters of this district, and they ranged from 0·01 to 0·09 parts per million. One part per million has been recommended for addition to water in order to help to preserve children's teeth.

Nine waters were examined for phenol content but none was detected. Phenol concentrations of 0·005 parts per million are said to produce noticeable taints in drinking water which is subjected to chlorination, but even then it is not generally considered to be harmful material in such low concentration. A number of attempts were made in 1972 to find a more sensitive test for phenols, because the WHO limit for phenols in drinking water (namely 0·001 part per million as the maximum desirable level and 0·002 parts per million as the maximum permissible level) is approximately equal to the sensitivity of the tests which can be applied to ordinary size water samples submitted for analysis. There is little doubt however, that in the present state of chemistry any special investigation of phenol content of drinking water will have to involve sampling officers in taking separate large volume samples specially for that one determination.

Four samples out of the total of two hundred and twenty-seven submitted were submitted by the County Medical Officer of Health; 4 by the County Architect; 4 by the County Social Services; 2 by the County Surveyor; 2 by the Lakes and Lune Water Board; 5 by Liverpool Corporation Water Works; 3 by the North Western Road Construction Unit; 1 by H.M. Prison, Preston, and the others by the following Local Authorities:— City of Lancaster 8; County Borough of Barrow 2; County Borough of Preston 3; County Borough of Southport 42. Boroughs of Accrington 14; Chorley 4; Darwen 4; Haslingden 10; Morecambe and Heysham 12; Urban Districts of Adlington 2; Aspall 3; Formby 1; Fulwood 1; Huyton 4; Kirkby 10; Orrell 2; Rainford 13; Standish with Langtree 2; Thornton Cleveleys 1; Turton 1; Ulverston 1; Walton le Dale 2; Withnell 1; Rural Districts of Chorley 2; Clitheroe 3; Garstang 5; Lancaster 1; Lunesdale 8; North Lonsdale 4; Preston 4; West Lancs. 14; Whiston 14. In addition to the above, there were four samples submitted privately for analyses.

Toxic Metals in Water

Two hundred and twelve samples of potable water were tested for lead during 1972, one hundred and sixty-three were tested for copper, one hundred and sixty were tested for zinc and one hundred and fifty-four were tested for cadmium.

The Third Edition of International Standards for Drinking Water published by the WHO in 1971 recommends an upper limit of concentration for lead of not more than 0.1 mgm per litre (0.1 part per million) which equals the long standing European Standard. The European Standard also makes the provision, "In no instance should the concentration of lead (as Pb) exceed 0.3 mgm per litre after 16 hours contact with the pipes", but these words do not appear in the International Standards.

One abnormally high lead result was obtained in 1972. This was from a "First Draw Sample" derived from a spring. The amount found was 1.3 parts per million (W512).

The results for lead are tabulated in Table 37.

Table 37
Lead in Waters 1972

Lead Parts per million	None detected	Less than 0.10	0.11 to 0.30	0.31 to 1.0	Over 1.0
Number of Samples ...	131	82	6	1	1

Traces of copper were found in forty-one of the potable waters examined, but in no case was the usually accepted maximum limit of 1.0 part per million reached. For copper, the WHO has a large difference between its "Highest desirable level" of 0.05 part per million, and its "Maximum Permissible Level" of 1.5 parts per million. Twenty-eight samples were found with copper contents between these two limits. The highest amount found was 0.9 part per million.

Traces of zinc were found in thirty-one of the potable waters tested for its presence, but in no case was the WHO "Highest Desirable Level" of 5 parts per million reached. The largest amount found was 2.8 parts per million.

Iron was found in all the samples tested for it. Amounts in excess of 0.3 part per million (above which it is generally considered that complaints of staining or turbidity occur) were found in thirty-eight instances. Once again, the WHO recommends different limits, the "Highest Desirable Level" being 0.1 part per million and the "Maximum Permissible Level" being 0.1 part per million and the "Maximum Permissible Level" being 1.0

part per million. The highest quantity of iron found in a drinking water sample was 12·8 parts per million, but almost all of it was in an insoluble form.

The results obtained for iron are tabulated in Table 38.

Table 38
Iron in Water 1972

Iron Parts per Million ...	Less than 0·1	0·11 to 0·30	0·31 to 1·0	Over 1·0
Number of Samples ...	37	88	28	10

Aluminium was found in five of the waters which were tested for it. The highest amount found was 21 parts per million of which 2 parts per million were soluble. In this case the water contained a large amount of suspended matter consisting of material typical of back-wash floc from a sand filter. Boiled water from an aluminium kettle was said to impart a taste to tea, and it did contain 3·1 parts per million of aluminium. (The original tap water was found to be free from aluminium). The boiled water was free from significant amounts of tin, chromium and nickel, and the laboratory could not confirm that tea made from water boiled in the kettle had any peculiarities.

Cadmium was absent from the one hundred and fifty-four waters which were tested for it during 1972.

OTHER WATERS, EFFLUENTS, ETC.

One hundred and twenty samples were submitted in 1972 under the heading of "Other Waters". Twenty-six samples were submitted from a sewage works following the discovery of 0·13 parts per million of potassium cyanide in the effluent water discharging into a river. Fish in the river had died, but the cause of death appeared to be a combination of the traces of cyanide with lack of oxygen in the water due to an abnormally dry spell, the river having dropped considerably below its usual level. (E136, E141/147, E150/156, E159/164, E168/172).

Five samples were submitted from a sewage purification plant. In one case the samples consisted of river water, river water plus sewage, and sewage effluent. The first two were classified as "Bad" or "Polluted", and the effluent had a suspended solids content of 31 parts per million, which is slightly in excess of the maximum of 30 parts per million recommended by the Royal Commission. Two more samples, examined later in the year, consisted of a sewage which became classified as being only weak strength sewage, and a final effluent which nevertheless failed to comply with the general Royal Commission standards. (E068/070, E176/177).

Three samples from another sewage works consisted of sewage effluent, settled sewage and raw sewage. That final effluent also failed to comply with the general Standard of the Royal Commission. (E102/104).

Fifteen samples of seepage water were submitted to the laboratory in attempts to discover their sources. Two appeared to be tap waters, one seemed to be either a tap water or a well water, and one appeared to be a sub soil water. Two waters contained anionic detergent, indicating that domestic drainage had probably been their source. (E071, E127). A suspected defect in a drainage system resulted in three samples being submitted from one cellar where water was appearing. Addition of fluorescein and potassium sulphate to the nearby suspected drainage system and subsequent analysis for these chemicals in the cellar water failed to confirm that the seepage water originated in the drains which were under suspicion. (E078, E088, E109).

Four samples, taken in connection with the flooding of a basement floor and suspected of containing sewage, consisted of two quantities taken from a pipe below the basement, through which the water seemed to enter, and two more from the basement floor itself. In the first set of samples the water from the pipe had an analysis which was equivalent to about one-tenth the strength of 'weak' sewage, and the water from the floor had about half the sewage strength of that incoming water. The second set of samples, taken seven months later, showed an improvement in the water from the pipe but the floor water was not much changed. The sewage component was older but there had been little dilution and evidently no draining away. (E086/087, E165/166).

Analysis of a liquid percolating through a basement wall showed that a likely source could have been drainage from a carriageway. Faecal bacteria were present in the water but the absence of detergent made any association with domestic drainage seem unlikely (E097).

A very polluted drainage water which contained a small amount of chlorphenols suggested that an attempt had been made to disinfect the water. No anionic detergent was present and it was suggested that a high concentration of water from broken toilet soil pipes may have been the source of the polluted seepage water (E101). Two further seepage waters which were entering excavations around concrete foundations to a building were analysed in order to determine whether their sulphate content was likely to be detrimental to the concrete. One of the waters contained 390 parts per million of sulphate. This is higher than Building Research Digest No. 90 recommends, and it was suggested that a sulphate resisting Portland Cement be used for any repair work which was to be undertaken there (E120/121).

Two waters from an old river course were submitted in order to assess their effect on fish. The first sample was appreciably more polluted than one submitted from the same source in June 1971, but the second sample showed an improvement. The waters contained nothing toxic but the large amount of organic matter present in them would be likely to deplete the

water of its oxygen content during warm weather. (E080 and E128). Two other samples of private lodge waters were examined, these being taken from the same source as two similar samples which had been analysed in 1971; in this case too, although nothing toxic was present in the waters, fish introduced to the lodges would have been likely to die in summer through lack of oxygen, and ideally the water would have needed to be diluted five times with clean water to make the lodges habitable for sporting fish (E118/119).

Another lodge water was suspected of containing sewage, and although test specimens of fish survived in this water when it was kept mechanically aerated in the laboratory, it would have needed to have been diluted sixteen times with clean water to have been made suitable for fish. (E158) A further lodge water was classified as being "Fairly clean to Doubtful", but small traces of chromium in it would emphasise the classification "Doubtful" with regard to the possible survival of fish (E/092).

Of two stream waters which were analysed in 1972 one was classified as "Bad" or "Polluted" and the other was classified as "Fairly clean" and was thought to be suitable for the introduction of fish (E091 and E131).

Two brook waters were submitted, both in connection with some discharges which were said to have been made into them. One was thought to have been contaminated with an effluent from a tin smelting works and the stream's arsenic content was just over 10 parts per million. It was classified as "Bad" or "Polluted". The other water contained pollution from a garage and it shewed evidence of the presence of mineral oil, mineral grease and detergent.

Cyanide was absent from two pond water samples in which its presence had been suspected, and another pond water was classified as being slightly polluted but suitable for cattle watering (E075/E076 and E083).

Two lake waters were found to have B.O.D. figures of 6.8 parts per million and 4.2 parts per million, and they would, had they been rivers, have been classified as "River of Doubtful Purity" (E148/E149).

One river water was classified as being equivalent to a borderline standard effluent. In this case the classification was based only on an "impurity figure" and on the suspended solids, (E 175) because the quantity submitted was too small for a full analysis to be performed upon it.

Water from a cattle trough had a cloudy appearance and contained about 0.3 per cent of a copolymer of butadiene rubber (E137). Further reference is made to this event in the Miscellaneous section of the report.

Two water samples were taken from near the inlet and from near the outlet of a pool where Dolphins performed. These samples shewed the condition of the waters to be slightly worse than when similar samples were taken during 1971 inasmuch as the water at the outlet shewed more urea to be present than near the inlet. The pollution was probably that

originating with the animals themselves. They were presumably contaminating the water a little faster than the flow allowed for (E173 and E174).

Waters from a central heating system showed evidence of rather erratic water treatment. The tank feed water and one of the condensates had similar composition, while another condensate water was found to be acid in reaction and it also showed a high concentration of sulphate, presumably due to excessive use of a sodium sulphite treatment material. Two further samples from the same system also showed that water from the softening plant was contaminated with back-wash water, and that the boiler itself had meanwhile been overtreated, presumably to correct the situation found previously (E098/E100, E105/E106). It rather seemed that some sort of facilities for testing the water had existed but that the people concerned had lost touch with what they were about. They had been doing Total Dissolved Solids on what they thought was the boiler water itself, and cheerfully logging figures of 3,500 parts per million. Perhaps they had been testing blow down water. Damage had resulted from the neglect. The pipes were lined with loose iron oxide and pipes both in the boiler and in the calorifier were corroded.

The system needed to be made alkaline with something like trisodium phosphate and kept with about fifty parts per million of phosphate in the boiler. The laboratory provided what it hoped was a simple method for testing for phosphate, suggesting that a measured 100 mls. of water should be titrated to pH 5.1 with a mixture of Bromocresol green and Methyl red (80 parts and 20 parts in methylated spirit) using 0.02 N Sodium Carbonate, then that volume should have added to it 2 mls. of neutralised 5% Cerous Nitrate (free from rare earths). When an excess of phosphate is present the solution should turn red, and a second titration with the sodium carbonate solution should be made to restore the solution to neutrality. This second titration $\times 9.5 =$ parts/million of $-\text{PO}_4$. Whether the information was ever of any use to anybody was never discovered.

There were two trade effluent samples examined in connection with a 'Consent to Discharge an Effluent', in which five parts per million each of naphtha and of toluol were allowed. Naphthas are straight-run distillates of crude oil which fall in the gasolene range without further processing, and the firm had stated that these were no longer in use in their premises, their place having been taken by white spirits. Special boiling point spirits and white spirits are obtained by further distillation of the appropriate gasolene fractions in an appropriate plant designed to give a high degree of fractionation and products of narrow boiling point range. Those falling within the normal gasolene range of boiling points are themselves sometimes called naphthas, but the white spirits usually fall in fractions intermediate between gasolene and kerosene, and derive from crude oil distillates in the range of 150 to 200°C. The white spirits are usually classified by their aromatic content. Those which have only about 15 per cent of aromatics are used for cleaning purposes and those having 45 to 80 per cent of aromatics are used as paint solvents. Nevertheless a typical white spirit would have a specific gravity of a little under 0.8 (i.e. 0.785 to 0.795). Newer solvents exist, like Shell SBP 6, a special petroleum distillate sold with a precise specification, boiling between 140 and 163°C and

containing 20 per cent aromatics, and these can be confused with the white spirits. The "Consents to Discharge" were therefore out of date, but the spirit in which they had been written was still valid, and there was clearly something seriously wrong with the two samples, both of which had a layer of solvent floating on their surfaces. The amounts of insoluble white spirit present were of the order of 90 and 550 parts per million respectively, and those of insoluble toluene were of the order of 5 and 35 parts per million. Further solvent was dispersed in the waters so that the total solvent present was about 290 ppm in one and 790 ppm in the other. There may have been a prosecution on these results but the laboratory was not informed of the outcome.

A water from an air conditioning unit showed that it contained suspended matter composed mainly of fungal mycelium (E157).

Six other water samples are referred to in the Miscellaneous section of the report. These consisted of the following. Groundwater tested for sulphate content; a lodge water examined for cyanide content; a manhole water examined for petroleum spirit; a latex/water mixture from a settling tank and two deposits from drinking water heaters (M986, M022, M285, M400, M487/M488).

Thirty-two samples of water taken from swimming pools were examined during the year, but only three were taken from schools swimming baths. The Ministry of Health in 1951 recommended that the pH of swimming bath water should exceed 7 but should not exceed 8, and that the total residual chlorine (where marginal chlorination was being practised) should not be less than 0.2 parts per million or much greater than 0.5 parts per million. More modern swimming bath practice favours the presence of rather more chlorine in appreciably cleaner water, so that it is now commoner to find that swimming pools are being maintained with chlorine levels of between 1.0 and 2.0 parts per million. Twelve samples were found to be in reasonable agreement with these recommendations but three baths were found to be lacking the preferred chlorine contents. Two of the school swimming bath waters were taken from pools where cyanuric acid treatment was being used. Although both samples were in agreement with the Ministry recommendation for chlorine it was suggested that the dose be increased in each case. The second sample was hazy, due to the presence of bacteria and vegetable fibres, so the bath was evidently being used at a greater loading than the chlorine dosage had allowed for. A question put to the laboratory during the year concerned the dumping of school swimming pool water which contained 500 parts per million of chlor-cyanuric acid. The laboratory pointed out that it is generally considered to be non-toxic (it is said that mammals can drink it in five per cent solution) and that some River Authorities use it in effluent treatment. The chlorinated household scouring powders contain it, and hospitals and dairies use it, so presumably the River Authorities do not mind it. There must, nevertheless, be tons of it going into the world's rivers. (E072, E114).

The other school swimming bath water contained a large excess of chlorine (Free residual 15·0 parts per million. Total residual 17·5 parts per million). Here the high dosage had been caused by use of the D.P.D. method of testing for chlorine. Above levels of about 5 parts per million the test becomes non-linear, and at about 20 parts per million the colour on which the test depends can be bleached by the chlorine excess.

In cases where no reaction occurs with the test even though large amounts of chlorine are known to be in use, the test should be repeated on dilutions of swimming bath water with clean water (E132).

At another swimming pool where maintenance staff were wrongly using this method of testing, the water gave a free residual chlorine of 3·9 parts per million and a total residual chlorine of 5·1 parts per million. (E130). Despite the high chlorine content, the water was found to contain appreciable quantities of ammonia and the treatment had gone so far out of balance that the pool was turbid from precipitating aluminium which had been added to aid the filtration process.

In one instance a swimming pool operator was himself worried lest the chlorine in his pool invalidated the Phenol Red test he used for pH control. A part of the testing performed in the laboratory on Miscellaneous Sample M851 (which was swimming pool treatment material) established that Phenol Red readings were not invalidated when the water had been chlorinated up to three parts per million of chlorine. The pool concerned has been tested by the laboratory for many years, and has never been found to contain as much chlorine as that.

PART IV

RADIOACTIVITY

The routine assessments of radioactivity in air, rainwater and tapwater continued during the year 1972, although the values found are currently so low as to be regarded as negligible. Because the activity is so small the routine testing comprises measurement of total beta activity, with quarterly examinations for the actual Strontium 90 content carried out only on bulked samples accumulated during the whole period.

The samples which were tested comprised 14 air samples, 12 rainwaters and 13 bulked tapwaters. In addition Strontium 90 was determined in six samples of milk. Two of these were specimens of milk accumulated in the year 1971 but the other four were built up in each quarter by adding together small portions of the laboratory's samples of milk taken from all the milk heat-treatment plants in Lancashire. In each case therefore the sample taken for radioactivity measurement may be regarded as being representative of about eight million gallons of milk. There were thus forty-five determinations made to provide a measure of the radioactive contamination which affected Lancastrians in the year 1972.

The average value both for total beta activity and Strontium 90 are shown in table 39 for air, rainwater, tapwater and milk, where they may be compared with the corresponding results of the previous two years:

Table 39
Radioactivity Measurements
Yearly averages 1970, 1971 and 1972

	1970		1971		1972	
	Total Beta Activity (Picocuries)	Strontium 90 (Picocuries)	Total Beta Activity (Picocuries)	Strontium 90 (Picocuries)	Total Beta Activity (Picocuries)	Strontium 90 (Picocuries)
Air Samples (per cubic metre)	0.066	0.0019	0.085	0.0010	0.022	0.0004
Rainwater (per square yard)		687		543		175
(per litre)	82	0.82	94	0.80	36	0.24
Upland Surface Tapwater (per litre)	3.2	0.47	3.7	0.48	2.8	0.35
Milk (per gram of calcium)		5.53		4.15		2.60

There were no megaton nuclear tests carried out during 1971 and 1972, and the fact is reflected in the activities found both for the total beta activity and for Strontium 90. The activities in air and rainwater samples during 1972 were thus only about one-third of the 1971 activities. The radioactivity which occurs in tapwater and in milk is subject to indirect influences such as storage factors in reservoirs, release from soil, the storage of fodder and food chain accumulations, so the changes which occur in tapwater and milk are less dramatic and the Strontium 90 activities seen

in these two commodities are only reduced to about two-thirds of the 1971 activities.

The Maximum Permissible Concentration for Strontium 90 in air is currently stated to be $13.3 \text{ pc per metre}^3$, for drinking water it is 133 picocuries per litre and for milk it is 270 picocuries per gram of calcium which amounts to a little under 200 picocuries per pint per day.

There were three further enquiries made in 1972 about radioactivity. The first of these was a backlash from that recurring problem of the possibility of pollution at Southport. As far as the information reaching this laboratory can be interpreted, it would seem that what little pollution Southport does enjoy is a present from the Mersey, but every now and again something disreputable is said about the Ribble, and in late 1971 it must have been something to do with the Uranium fuel plant low-activity liquid-wastes discharged from Salwick, or the possibility of seepage from the low-activity solid-wastes buried in clay pits at Ulnes Walton. The laboratory was therefore presented with two samples of shrimps which had been fished in the Ribble Estuary. Sample number 1649 consisted of live shrimps and sample 1650 consisted of boiled peeled shrimps taken from the same catch. The whole shrimps, complete with their chitinous shells, contained 0.29 per cent of potassium as compared with only 0.18 per cent in the picked shrimps; but even allowing for this, there was an excess of beta activity over that due to potassium, amounting to approximately 0.2 counts per minute per gram when measured in a liquid counter. This was calculated to be equivalent to about 1.5 picocuries per gram. In the shrimps prepared for eating however, there was no excess radioactivity over that due to the natural potassium in the fish.

Samples M561 and M562 were smoke-stain papers from two areas close to the site of the new Nuclear Power Station at Heysham. It had been hoped that such aerial filtrates (each from about sixty cubic feet of air per stain), would provide a measure of atmospheric radioactive background. The laboratory had only just come to the end of a very prolonged period of having been unable to get its counting equipment serviced, so the testing involved quite a lot of re-calibrating. When nothing very positive seemed to be emerging from the tests, some calculations were done. The maximum permitted concentration of Unidentified Radionuclides in Air (as given in table 4 of Report of Committee II on Permissible Dose for Internal Radiation—published for I.C.R.P. by Pergamon Press) is 4×10^{-13} micro curies per cubic foot or 0.7 picocuries in the sixty cubic foot specimens. With the laboratory's counter, that whole industrial limit would only have given 0.2 counts per minute over background, and the limit for large populations would only be a tenth of that. The people who operate the reactor will consider discharges which are far below the maximum to be "serious incidents", so it was clear that the laboratory equipment was far too insensitive to be of use for such a purpose as check monitoring for leaks in a power station. It was therefore recommended that the local authority concerned should ask the Electricity Board to provide copies of their own monitoring results. Any abnormalities could then be questioned on figures which nobody would dispute.

The third radioactivity enquiry of 1972 was one connected with sample M928. This was material said to have been stored for some years in a quarry which was now wanted by the farmer who owned the land. Nothing much was known about the material, but it was believed to have been intended for use in insecticide preparations. On the letter which accompanied the sample it was given the name Thorite Sand, and the question posed was whether it contained any chemicals which should not be dumped in an open quarry.

The material contained little except thorium and silica, the thorium being present at a level of about eight per cent . . . but thorium is weakly radioactive, so the activity was measured and found to be about 7.5×10^{-2} micro curie per gram. The laboratory reported that Schedule 3 to the Radioactive Substances Act, 1960, had been revised in Statutory Instrument, 1962, No. 2648, and in that document it was suggested that the activity of a natural element to be disposed of by tipping should not exceed 4×10^{-4} micro curies per gram. It therefore recommended that contact be made with the Senior Radiochemical Inspector, Department of the Environment, Queen Annes Chambers, Tothill Street, London, SW1H 9JY for advice about its disposal. At the same time an informal enquiry was made at the British Nuclear Fuel Company about the possibility of dumping it at Drigg in Cumberland. From this source it was later learned that there had been tons and tons of this Thorite Sand involved, and that the Department of the Environment had been horrified to find so large a dump of such material. The laboratory is still curious about the outcome of the enquiry, especially as it found itself the illegal owner of seven kilograms of a radioactive material it ought not to dispose of. In the event, a member of staff living near the shore disposed of it in one hundred gram quantities by scattering it below high tide level. Even that may not have been quite legal.

PART V

MISCELLANEOUS

The number of samples of a miscellaneous nature which were examined by the laboratory in 1972 was nearly twice that of 1971, but the number was swelled by 239 examinations performed for members of the public under The Road Safety Act, 1967, up until July, and then under The Road Traffic Act, 1972, during the latter half of the year. The majority of people apprehended under this legislation elected to give blood specimens rather than urine, so only nineteen samples of urine were included in this number.

The new Act gathers together various provisions which formerly were somewhat scattered. Thus the opportunity to have a second breath test at a police station is now provided by part of Section 8 of the Act instead of being merely in a guidance leaflet, and the right of the accused person to have a second blood or urine sample taken for verification purposes is part of Section 10 of the new Act instead of being part of the old 1962 Act which was so apt to get forgotten when the 1967 Act came along. The specified procedure for obtaining a sample of urine, namely that two specimens shall be produced within an hour, the first of which is to be discarded, is meant to allow for the fact that urine already in the bladder will dilute alcoholic urine secreted from alcoholic blood to the bladder, an effect which makes the maximum concentration of alcohol in the urine appear to lag behind that in the blood. The urine samples tend to be favoured by people who have done all their drinking within a very short time, since perhaps there *is* a tendency for the urine sample to give an average value and to show fewer 'peaks'. Such dodges are somewhat in the nature of a gamble however, since the timing of the taking of the blood specimens would need to be particularly unfortunate for the police doctor to obtain a sample just at the moment of peak alcohol concentration.

Only forty-four of the blood samples contained less alcohol than the limit of 80 milligrams per 100 millilitres specified in Section 12 of the Act, and only four of the urine samples contained less than the limit of 107 milligrams per 100 millilitres for urine. Blood samples are sent with anticoagulant and preservative added; the preservative being generally considered to correspond with about one per cent of sodium fluoride in a full capsule, but the average amount found in the blood samples examined for this material in 1972 was 1.3 per cent, and was found to rise to as much as 1.6 per cent even in an occasional full capsule. Urine samples are preserved with phenyl mercuric nitrate and the amounts of that preservative found were approximately 0.15 per cent. These preservatives are sometimes investigated in order to be sure that samples have not been tampered with, since many of the police doctors still do not seal the samples adequately . . . moreover it does seem incredible that anybody should pay the analysis fee for a blood which contained only four milligrams per 100 millilitres, as happened on one occasion and the laboratory likes to feel that it will not be used to swear in court to figures which apply

to replaced blood or urine. The quantity of preservative present when only four milligrams of alcohol per 100 millilitres were found confirmed that the sample was intact however. It is equally incredible that people who had drunk so much that the alcohol in their blood should be as high as 297 milligrams per 100 millilitres, or in a urine should have reached 340 milligrams per 100 millilitres, could also have thought it was worth having check analyses performed.

In only two instances were disagreements with the Forensic Laboratories sufficient to involve attendance at court on behalf of defendants, and in both instances the courts extended the defendant the benefit of the doubt. In neither instance however could it be absolutely certain that no tampering with the samples had taken place, since neither package arrived at the laboratory properly sealed.

The laboratory refused to examine one sample which obviously had been interfered with, and in addition was found to contain no preservative. This was sample M804, and the applicant's cheque was returned.

Only ten atmospheric pollution returns were made to The Department of Trade and Industry in 1972, the authority on whose behalf they were sent having warned that it intended to discontinue the measurements in 1973. Nothing was revealed by the analyses which differed significantly from the findings of previous years.

As in so much besides, the investigation of atmospheric pollution is sliding out of Public Analysts hands. In one or two individual authorities, Leeds being one, some attempts have been made to monitor contaminants such as lead, but the Warren Springs Laboratory of the Department of Trade and Industry is already working on a survey, which they call the Five Town Survey, for the Ministry of the Environment. In it they propose to do sampling for nitrogen gases, ozone, lead and other materials, at three hourly intervals, day and night, in order to correlate pollution with traffic flow. They are spending £15,000 on each sampling site, and no local authority would be able to make anything like an equivalent evaluation of the atmosphere. Yet Birmingham made some money available to the University of Aston in order to do a lead survey at the Midlands "Spaghetti Junction" on M.6. Motorway, and Lancashire Education Committee made about £10,000 available to Liverpool University for several projects together, one of which was concerned with environmental pollution.

Against such a background of outpoured wealth the efforts of County Laboratory look rather puny. However, when suggestions were made that the East Cliff heating boilers were producing toxic fumes in one of the typing rooms, a series of tests reported under the number M844 showed that they were not. A question of whether carbon monoxide poisoning was likely to be the fate of the inhabitants of a Southport flat was investigated by the laboratory, and it was found that compared with the tentative limit of 50 parts per million usually adopted for continuous inhalation in factory atmospheres the air in the closed flat, sample M066, nowhere had levels in excess of 0.2 parts in a million parts of air.

The air in the Duplicator Room at one of the Lancashire Local Authority Council Offices was reported upon as sample M226, when each cubic metre of air was found to contain 48 milligrams of perchloroethylene and 36 milligrams of petroleum vapour. The threshold limit values for these vapours are 670 and 2,000 milligrams per cubic metre respectively, and keeping the concentration down proved to involve nothing more than good housekeeping. Sample M189 was a cleaning solvent which had already been analysed in connection with the preceding complaint and although it was found to be a tinted mixture composed of 40 per cent petroleum (of boiling range 120–160°C), thirty-six per cent of white spirit and twenty-four per cent of perchloroethylene, strangely enough, its flash point was higher than that which would bring it into the classification "Mixture of Petroleum" for which special storage conditions would apply. A similar concern about vapour and the attendant possible fire risk was associated with sample M277, which was damp-proof injection solution for injecting into the walls of buildings. It consisted of a silicone material dissolved as a four per cent solution in white spirit.

Wall cavity filling, about which the magazine WHICH? was so enthusiastic, was made available to the laboratory as sample M343 and as part of sample M073. Both proved to be urea formaldehyde resin in a cellular foam. The first of these was brought to the laboratory within an hour of injection, and it then contained 86 per cent of water and 13,640 parts of free formaldehyde in a million parts of the foam. Two days later it contained only 3 per cent of water and 950 parts of formaldehyde. It was soon a crisp dry material with only traces of formaldehyde left in it. The portion submitted with sample M073 however, was already more than a month old when examined, yet it still had 875 parts of formaldehyde in a million parts of the resin and it was causing an odour in the house. In fact the highest concentration of formaldehyde found in the house was in a hot water cylinder cupboard where it reached a level of 1.6 parts per million by volume. The Ministry of Labour booklet "Dusts and Fumes in Factory Atmospheres" recommends no more than 5 parts per million, so the level found was significant. Three weeks later the air was tested again and reported as sample M126. The highest concentration then was found to be 0.53 parts so the formaldehyde was getting less with the passage of time. Nevertheless, when compared with sample M343 it did seem that something abnormal had happened during the cure at these premises.

The limits of pollutant which may be safely breathed were exceeded in two out of three air samples taken in an investigation into the atmosphere in a sewer. The pollutants were White Spirit and Toluene. Although there was no explosion hazard as had been suggested, the levels of toluene in the factory inspection chamber were of the order of 2,200 milligrams per cubic metre, and in the council's sewer they were about 5,800 milligrams per cubic metre. "Dust and Fumes in Factory Atmospheres" recommends a limit of 750 milligrams per cubic metre where people are working.

Sample M190 was in fact a pair of insect killing vaporisers, each of which was subsequently found to contain about eight grams of Dichlorvos. They were said to have caused sneezing, sore throats and running eyes.

The amounts found in the air when they were freshly opened and kept in an unventilated room of 3,000 cubic feet capacity for 50 hours, was 1 microgram per litre, which equalled the Threshold Limit Value. "New Scientist" for 2nd March, 1972, on page 490, had suggested that such packs should not give concentrations greater than 0.3 microgram per litre, so it was recommended that the sampled preparation should not be used where fatty foods were stored—but on the other hand it was considered unlikely that the symptoms described would have occurred at concentrations less than forty times those found. Since medical opinions were called for, it was further recommended that the advice of the British Industrial Biological Research Association be obtained.

Professor Bryce Smith's Celebrated CONTROVERSY programme shown on B.B.C.2 on 30th August, 1971, does appear to have made people very conscious of the possibility of lead in their environment, and samples M113, M114 and M115 were taken to find the lead levels in the dust in the home of a householder in Rainford. Air which had been drawn through a filter paper had left behind 7 micrograms of lead, but nobody could provide the laboratory with an estimate of how much air had been drawn. Dust taken from the household vacuum cleaner contained 880 parts per million of lead however, and the lighter dust from the household carpet sweeper contained 250 parts. Figures were found for typical dusts, and these were:—

Coal smoke	200 to 500 p.p.m.
City dust	0.2 per cent
Fleet Street Dust (in traffic)	2 per cent
Dust from middle of motorway	5 per cent
Dust from the exhaust of motor vehicles	10 per cent

The household dust was therefore thought to be fairly typical of ordinary domestic dust and perhaps a little on the low side for a city dwelling.

Motorway contamination was said to be the polluting factor in an investigation into the lead in the air outside a bungalow near which a motorway had been opened. The householder changed his sampling dates once or twice, evidently hoping to record maximum traffic flow, and the laboratory was persuaded to set up a pump which drew 8.8 cubic metres of air through a CF/C glass fibre paper (0.8 micron pores) over a period of six and three-quarter hours. The analyst who dismantled the equipment expressed interest in some tyre marks near the equipment, but it seemed unlikely that the householder really had backed his car up to the sampling site, because the lead found was only 2 micrograms per cubic metre. A book by Morris P. Jacobs called *The Chemical Analysis of Air Pollutants* suggests that lead in air ranges from 0.1 microgram per cubic metre in the country, to 9 micrograms per cubic metre in a city like Philadelphia. The figure found was very close to the level determined some time ago in Preston, in light traffic conditions, and was calculated to be capable of giving rise to a daily intake of sixty micrograms, or about a fiftieth of the provisional estimate of the tolerable intake given in the Second Report

of the Working Party on Monitoring of Foodstuffs for Heavy Metals 1972. It is just a little questionable whether the municipal laboratories ought to be used to provide the bullets with which a householder might make an application for a reduction in his rates. "Judge not, that ye be not judged" saith the quotation (which no one nowadays will have read) . . . and probably there was no other laboratory nearby which could have answered even a genuine enquiry about a possible health hazard.

Two further dusts were submitted in connection with suspected damaging pollution, but these were more of a building enquiry. Asphalt was said to be being attacked, and samples M339 and M340 were said to be portions of the attacked asphalt. Neither material had anything to do with asphalt however. They probably both originated in an iron flue which was suffering some sulphur attack, and they might well have come from the building's own heating system. but they also contained vermiculite, sand, soot and miscellaneous organic matter such as might be found in any rooftop dust. Similarly, sample number M278 which was dust collected from window-sills, tops of cars and similar places—with a suggestion that it originated either at a wire works, an oil drum reclamation plant, an ink manufacturer or from food factories—was found to consist of sand, oil soot, textile fibres and very fine dust which might have originated in a far-away slag heap. The different components must have originated in different places, and they served to show that not all the ills of modern living necessarily stem from the nearby factory. In the case of sample M263, which was dockyard dust generated when unloading maize, the concern was with its possible content of insecticide, but the residues found were extremely small.

The investigation reported on page 226 of the 1971 Report, where phosphate emission from a factory had been suspected of having affected nearby plant life, was followed up in 1972 with samples M213, M291, M293 and even sample M128.

The question was resurrected initially with soil samples M120 and M121 on which lettuce plants had failed. The suspect soil contained half a per cent of phosphate, which was rather a large amount when compared with that in the comparison soil which accompanied it, and although the laboratory sample could not provide confirmation of the stories which accompanied the specimen, the soil did show signs of having been waterlogged and of having fungus in it. The descriptions of the lettuces (when divorced from stories of industrial pollution) tallied well with descriptions of *Botrytis cinerea* infection, which is common in lettuce plants on occasions when waterlogged soil gets splashed on to their leaves in periods of heavy rain. The rainwater sample M213 was found to be remarkable only for having a higher sulphate content than formerly, but the rainwater sample M291 did contain ammonium phosphate. Sample M293 was a pair of greased petri dishes exposed during part of the period during which sample M291 had been collected, and they bore about a dozen milligrams of powder having a density of 1.85 and a chemical composition very close to that of mono ammonium di-hydrogen phosphate. The suspected factory

made detergents, but this chemical is not a common ingredient of detergents.

Another soil sample, number M156, taken from nearby, also contained a little phosphate, its content being only in the region of 0.1 per cent; and it became evident that although there was a small emission of phosphate dust from somewhere in the neighbourhood, the problem with the lettuce plants had been one associated with the application to very wet soil of a top dressing of fertiliser which had not been dug in. Poor gardening practice was also evident with sample M134, which was soil said to have a gas works smell—but this soil had become waterlogged, and anaerobic bacteria had made it acid enough to release hydrogen sulphide from sulphides of iron which were present. It needed an enormous amount of lime (40 ozs. per yard) and a lot of digging. Sample M128 was soil which had turned green and was also thought to be chemically contaminated, but the green colour was caused by algae, *Ulotrichaceae* and *Chlorella* being the most prominent ones present. Much the same fear of deposited dust was connected with sample M329, which consisted of parts of weed plants. The "white deposit" there however, consisted of fungi—one a mildew and the other a "blight", of an *Alternaria* species.

Sample M1000 was a sample of grass which was said to be growing poorly. It was accompanied by a note which said that five years ago the laboratory had commented on the high zinc content of its underlying soil, which then had been fertilised with sewage sludge. It has been a little difficult to extract information from the laboratory's records ever since Organisation and Methods got at them, so the previous comments were not resurrected. The grasses were found to be *Poa Annua* and *Festuca* both of which showed red leaf-tip discolouration. The second grass might have thrived better if an accompanying mass of dead grass had not hampered it, but both varieties had a zinc content (expressed on the dry matter) of almost 2000 parts per million . . . the moisture content of the sample was 65 per cent. Four samples of topsoil accompanied the grass and bore the numbers M996 to M999. All four of these seemed to be from very near the surface and to have a pH (1:2½ soil/water slurry) of 6.2. They were well supplied with plant nutrients but the available zinc (0.5N Acetic/Amm Acetate) was 0.7, 0.8, 0.8 and 0.6 per cent respectively, the total zinc content being nearly one and a half per cent. This is far in excess of amounts given in such places as J. Sci. Fd. Agric 1972 page 1038. It was recommended either that the soil be limed alkaline and sown with coarse grass, or that further advice be sought from the Agricultural Development and Advisory Service of the Ministry.

Gardening troubles were also associated with sample M025, which was powder a gardener had retrieved from his garden and which he suspected a neighbour of spreading there. The powder was a horticultural preparation consisting of 8 per cent of 2:6 dichlorothiobenzamide in an inert silica powder base. This is a very unusual preparation, which is capable of killing new growth while permitting established plants to thrive. Since the laboratory could find no commercial preparation like it,

it was advised that Rothamsted Soils Laboratory be approached for suggestions about where such preparations are in use. The contamination of soil took on another aspect with sample M545, which consisted of grass and soil from a rugby pitch when players complained of developing rashes after their games. The cause was found to be quicklime left in the whitening used for marking out the pitch.

The sequence in which these items are being described calls for a split in the description of soil analyses in order to preserve the association with contamination which is currently being emphasised, and then to travel back to soils associated with building projects. Sometimes, of course, the two considerations are combined, as with samples M878 to M883 inclusive, which were soils taken from the site of an old gasworks, and upon which new building work was contemplated. All six samples had a "Gasworks Odour" and all contained "Spent Oxide", which is usually iron sulphide, but in five of the soils it had weathered to iron oxide and free sulphur. In one 'soil' there was appreciable dilution with coke, and in another there was dilution with disintegrating concrete. Coal tar bases remained in three of the soils, causing an appreciable increase in odour when they were made alkaline, and all six soils contained sulphate in excess of the 0.5 per cent above which Building Research Station Digest No. 31 considers that the use of any kind of Portland Cement concrete is contraindicated. It was advised that direct application to the Research Station at Watford be made before any attempts at construction work began.

Sample M931 was sludge from some old Gasworks tanks, which was being dumped into a sewer. It proved to be Water, 88 per cent; Greasy soil and carbon, 6 per cent; Gas oil, 4 per cent; and Gas naphtha 2 per cent. At least it presented no fire hazard down there in the pipes of last century (where B.B.C. showed men working, on 3rd February, 1973), but it would be interesting to hear what the sewage works manager thought of it when he acquired it. The chances are however, that with sufficient dilution he might have taken it in his stride.

It is surprising what bacteria are capable of digesting. Weathering and bacteria between them are capable of reducing even cyanide, in time, to carbonates, but the Deposit of Poisonous Waste Act 1972 was helped on to the Statute Books by means of a great deal of publicity about the dumping of cyanide. The laboratory got a back lash from that publicity in the following samples: M892 which was said to be liquor from a metal treatment plant where cyanide was used for case-hardening; M905, soil from a drum marked "Sodium Cyanide" but which was thought to have been at least five years old; M913, which was thought to be sodium cyanide but which actually proved to be impure lactose; M926, which was white powder taken from the residues in an almost empty drum marked SODIUM CYANIDE but which actually only had 3.8 per cent of cyanide left in the powder, and M947 which was crystalline white material taken from an old annealing bath found in the remaining debris of an old factory. The cyanide content (except in those cases indicated) invariably fell in the fifteen to sixteen parts per million range, and enquirers were advised to treat it with Chlorox and bury it. A series of six samples all from one tip

and numbered M893 to M898, established that no pre-Deposit of Poisonous Waste Act cyanide was affecting it. There was one instance in which cyanide had probably killed some fish, and samples M020, M021 and M022 were samples of the fish concerned, dregs from a drum which had been found floating in the water lodge where they died, and water taken to represent the general state of the lodge itself. The fish had been young roach, but their bodies had been attacked by other fish and they were submitted in putrifying condition. Nevertheless the amounts of cyanide found in their gills were significant. The water dregs in the drum contained sufficient cyanide to be liable to kill fish, and it was thought that the poisoned fish had perhaps swum close to investigate the drum. There was no cyanide in the lodge water as a whole, and the evidence of attack upon the dead fish by other fish showed that the majority of the fish in the lodge were still hale and hearty. It was therefore concluded that the drum had been an empty one when it was thrown into the water.

Sample M100 consisted of six punctured canisters which had contained Methyl Bromide and chlorpicrin, but they had no chemical residues in them when they came to the laboratory.

Samples M337 and M338 were specimens of trout and the body of a dead duck which were also thought to have died from cyanide poisoning, but the duck had died of a broken neck. The trout did contain traces of cyanide, and since traces of cyanide were then coming through with the effluent from a local sewage works the matter was investigated very fully, but no subsequent discharge of cyanide has been detected in that works' effluent. In fact, the gills of the trout were not of the colour one would associate with cyanide poisoning, but they were very congested with mucus, and the hind gut was inflamed. More-over the muscles contained 0.55 part per million of polychlorinated biphenyls. In *Bulletin of Environmental Contamination and Toxicology* 1971 Mar/Apr. page 116, fish are stated to show 50 per cent mortality when PCBs in their muscle reach 14 parts per million, so 0.55 part did not of itself appear significant, but fish showing intestinal troubles, having gills clogged with mucus, and signs of having been subjected to the effect of PCBs might perhaps have found a trace of cyanide just too much to add to their other troubles—and it did seem that death had been due to a combination of things.

Sample M472 consisted of seven fresh water fish comprising two pike, four perch and a roach. The liver of one perch was of a very light colour, but no poisons were found in it and the colour may have been due to disease. Cyanide in the gills of all the fish was fairly uniformly 0.09 part per million. Analyst 1959 page 747 suggests that such a quantity may have killed some salmon, but the reference points out that quantities as high as 0.107 part per million have been found in unpoisoned salmon. Coarser fish were felt likely to withstand more cyanide than salmon might tolerate, so the figure of 0.09 part was regarded as being 'natural'. In reaching that conclusion due regard was given to the colour of the gills. They were purple—an indication of oxygen starvation rather than of cyanide poisoning.

The Deposit of Poisonous Waste Act is a little vague inasmuch as it gives no instruction about having any check made on what an owner of a waste may say that his waste contains. Until local authorities grew used to the Act therefore, the laboratory was asked to advise about chemical wastes M242, M269, M270, M793, M908, M925, M956, M976 and M007. The first three proved to be of the composition stated by the owners. Sample M793 proved to be degraded paint pigment. Sample M908 was a paraffin solution of grease which had become emulsified with water. Sample M925 consisted of a 50/50 mixture of mixed solvents and water. Sample M956 consisted of degraded paint complete with solvents, and sample M976 was pale brown coloured transparent jelly with white lumps of fatty looking material suspended in it, which upon analysis proved to be some compound of polyoxyethylene ester type, in which the clear material contained 30 per cent of water and the white material contained only 20 per cent of water but otherwise was identical one with the other. It was not actually toxic, but because of its surfactant properties it was advised that the Rivers Authorities be advised of its proximity to their rivers. Sample M009 was said to be a latex residue and again the question asked was whether it was safe for putting on a tip. It contained 25 per cent of a styrene-butadiene co-polymer but there were no toxic materials present. Sample M254 was a small bottle of liquid which a member of the public had found in the garage of his new home, and wondered about throwing it down the drains. It proved to be distilled water.

Perhaps this is a suitable place to mention that samples M563, M564 and M565 were incrustations from sewage pumps, and that they consisted almost entirely of calcium carbonate.

Samples M933 to M944 inclusive consisted of sea shore sand from the mouth of a river estuary. The question posed was whether they contained toxic materials, but as absolutely no information could be obtained on what the composition of sea shore sand normally is, the results are shown below in case anyone ever needs to make a comparison:—

Mercury	...	...	...	0·009 to 0·080 parts per million
Copper	...	...	...	0·6 to 2·4 parts per million
Nickel	...	...	...	1·5 to 2·3 parts per million
Chromium	...	...	...	0·8 to 2·3 parts per million
Cobalt	...	...	...	1·3 to 2·3 parts per million
Lead	...	...	...	5·0 to 9·0 parts per million
Cadmium	...	...	...	0·18 to 0·34 parts per million
Zinc	...	...	...	11 to 26 parts per million
Petroleum extract	...	...	...	10 to 420 parts per million (85% mineral grease)
Cyanide	...	...	...	0·01 to 0·16 parts per million

Cyanides of iron may be a common constituent of river sand for all that this laboratory could discover.

Sample number M548 was yellow material deposited along the fore-shore, and it proved to be relatively valuable, reasonably fresh, palm oil.

The possibility of toxicity arose with some building demolition rubble. It was Sample M201 and it had been derived from a building where there had once been a brine cell, and little globules of spilt mercury could be seen nestling in it. Because of the heterogeneous nature of the sample it was divided into four selections, in which the mercury contents were found to be 0.024%, 0.027%, 0.031% and 0.020%—so it was reported in total as having a mercury content of 0.025 per cent, and as being unlikely to constitute a hazard on a tip. It had meanwhile been discovered how difficult the disposal of mercury might be, so it was advised that if larger pools of mercury were discovered in other parts of the building Mr. Graham at the Department of the Environment should be consulted on telephone 01-212 3683. After all—his department started all this! In fact Mr. Graham was likely to be very helpful and had already indicated that Messrs. I.C.I. at Hill House Works Runcorn 09285 6161 would sometimes undertake to process mercury waste by retorting it and recovering the mercury—although he suspected that they were running nearly 500 tons in arrears and might not be able to take more.

So here we are, back with soil again. Samples M987 and M988 were samples of soil taken from an area where sewage works construction was to take place, and they were submitted with ground water—sample M986. The Building Research Station Digests 90 and 30 indicated that the sulphate contents were well below the limits to be observed when using ordinary Portland Cements. Samples M569, M570 and M571, similarly, were soils taken from holes where alterations to old Air Raid Shelters were proposed. These also proved to be Class 1 sites where ordinary cements could be used.

Building enquiries in 1972 took a rather different form from those which were posed in 1971. Thus samples M838, M914 and M013 all were concerned with the same kind of plastic-covered cable. It was first met with on account of its appearance on market stalls at very low price—something in the range of a penny a yard seems to have been mentioned. The next time some appeared in the laboratory, it was in connection with failure on an electrical underfloor heating installation. On that occasion it was submitted with some of the concrete, sample M915, in which it had been laid, since there was a suggestion that the concrete might have attacked the plastic coating; but the concrete was very normal concrete made of one part cement to two parts aggregate, and it had no effect on PVC cable covering whatsoever. Plate 33 illustrates how the cable failed, and plate 34 shows how the iron wire core inside the plastic was found to be corroded. In some places the corrosion had eaten right through the conductor. It was not easy to decide whether the wire was an iron one or a steel, because it did contain traces of nickel, etc., but not in quantities which one would normally associate with steel—but it probably was wire specially developed to warm up on passage of a current. Since no reason for corrosion inside the insulation could be suggested, a portion of the sample was passed to the laboratories of Messrs. British Insulated Callendar

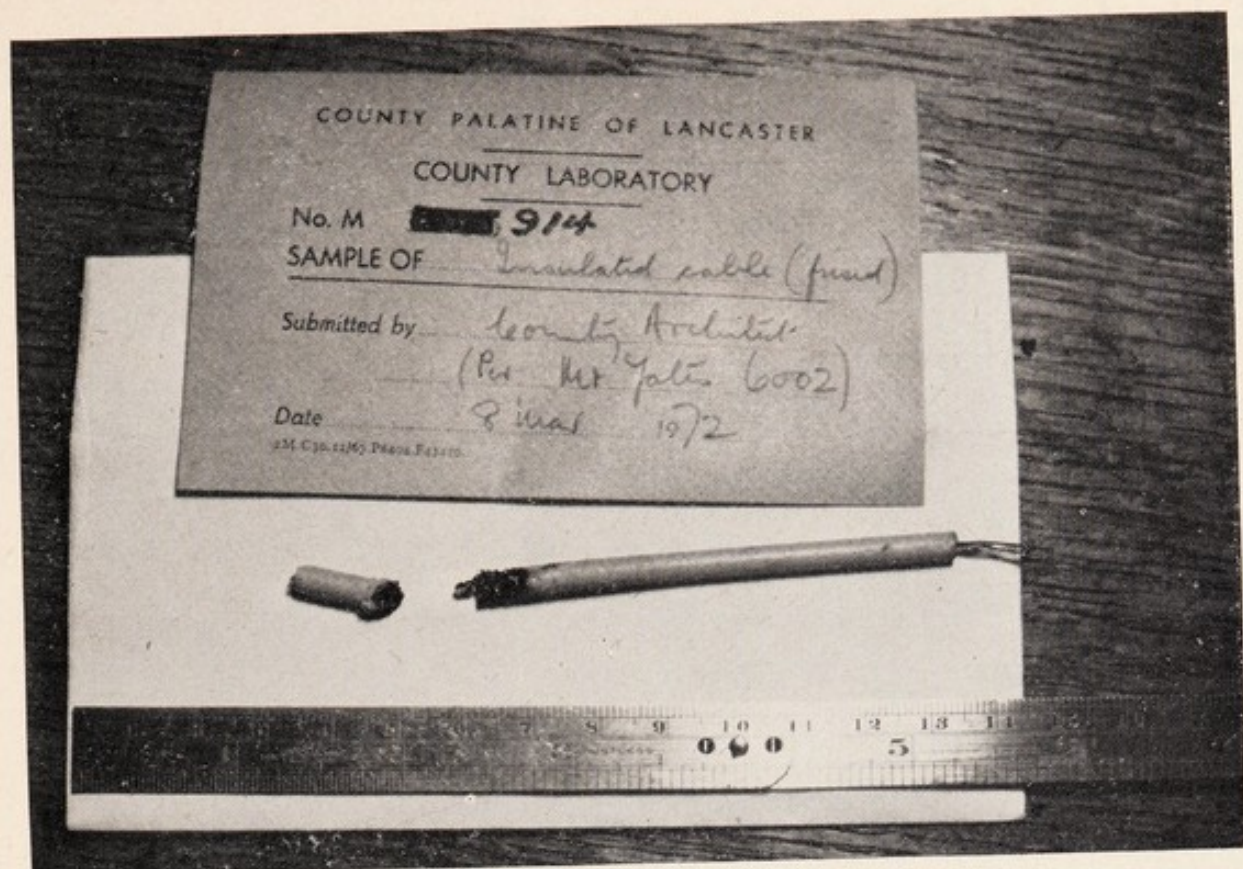


PLATE 33 Broken wire

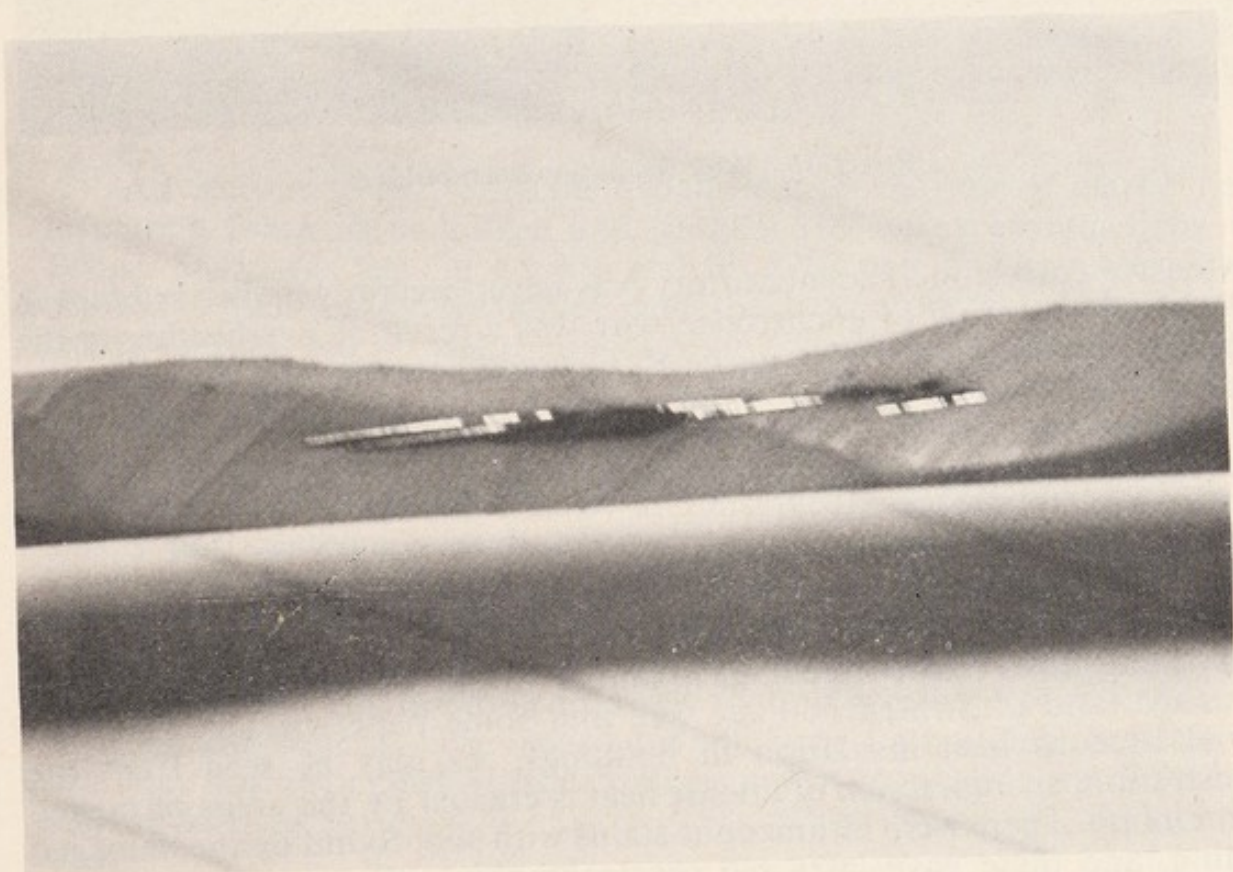


PLATE 34 Corroded wire

Cables Limited for another opinion. They examined the corrosion products by X-ray Diffraction methods, and found them to consist of nothing but iron oxide (Fe_2O_3). The firm did point out that where-ever a corrosion point had occurred, there was a little pocket or bubble in the PVC adjacent to the cable, and they suggested that these may have contained moisture. Sample M013 was yet another piece of similar cable. Plate 35 shows the holes in the plastic, but it also shows that there is no

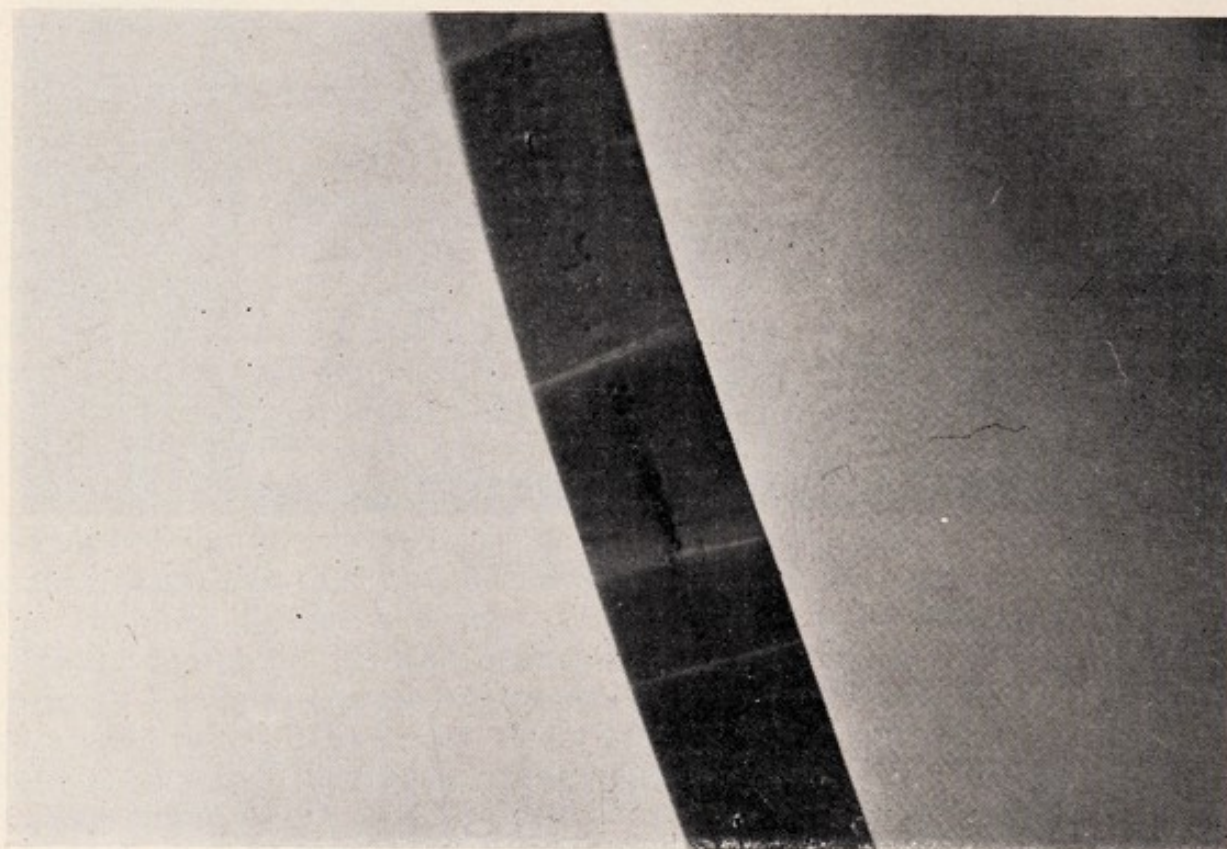


PLATE 35 Wire insulation with bubbles

extensive corrosion. The laboratory was never certain whether bubbles in the plastic covering of uncorroded wire was a result of overheating in the cable or whether moist wire inside PVC would corrode right down to iron oxide. There was no perforation of the PVC at the places of corrosion, but it was pointed out that if wire began to corrode, the conductor would become thinner, and would grow hot, so that rapid failure at a corrosion point was plausible.

Fire investigation was responsible for the examination of samples M005, M006 and M007, which were respectively a recessed lamp housing for fitting flush inside a ceiling, a similar fitting which had suffered fire damage (and illustrated in Plate 36), and some paper backed fibreglass wool used as heat insulation in buildings. As may be seen from the illustration, an impression of intense heat is created by the areas of melted aluminium. There were bitumenous stains with soot found on the damaged fitting, and these gave infra red spectrographic patterns and chromatograph patterns very like those obtained by pyrolysis of the bitumenised

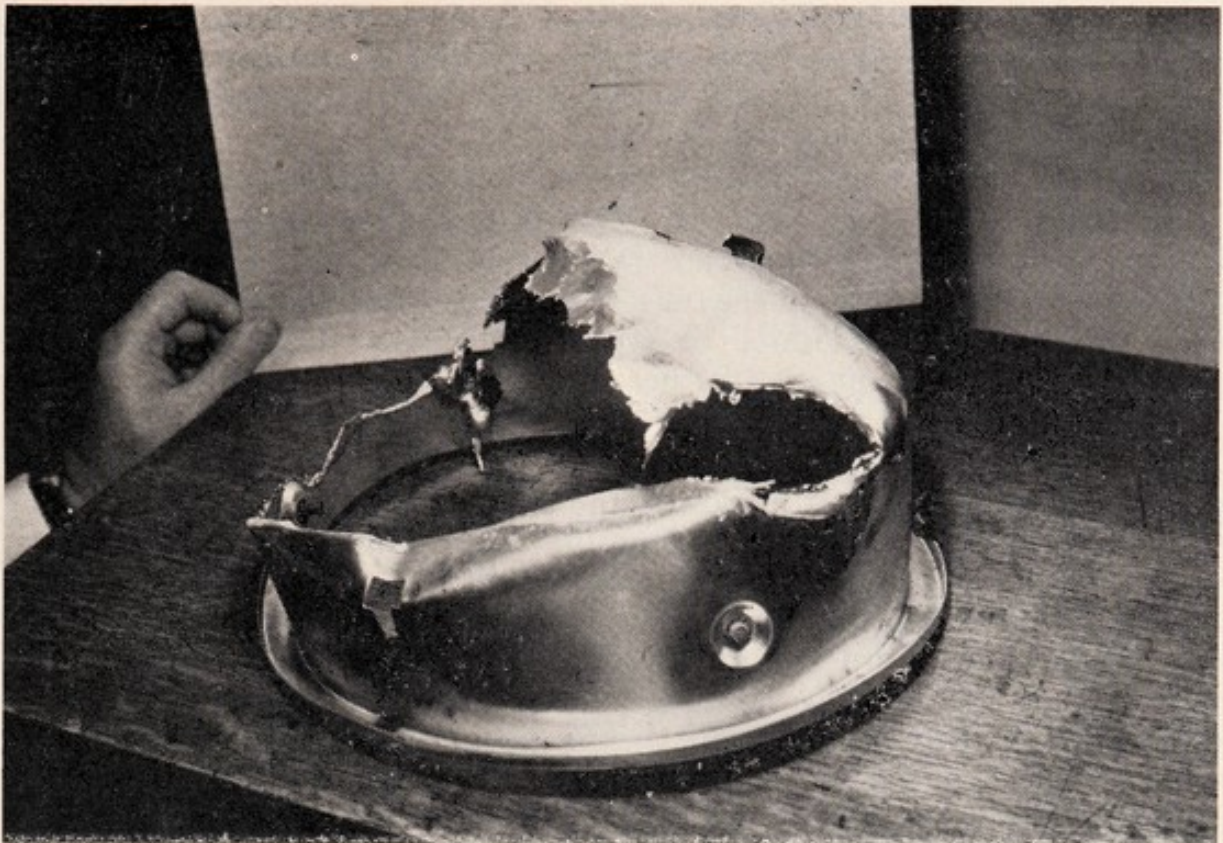


PLATE 36 Lamp fitting

paper which backed the fibreglass wool. Combustibility tests upon this bitumenised paper showed that it was extremely liable to catch fire, and it burned with an intensity well able to ignite timber. A single electric short nearby would therefore make the fibreglass backing paper something like tinder if it were used in a wooden construction.

Advice was sought from the department on the use of plastic heat-insulating foam in buildings, and sample M871 was examined by the British Standards tests in BS 476 and BS 2782 part 5. The material was certainly "Not Easily Ignitable" and the laboratory concluded that it would be classified as "Self Extinguishing". The November trial of Alfred Moskovits had not then brought concern about flammable building materials to public notice, but nevertheless the laboratory warned that the foam was a polyurethane foam which would add fuel to a fire already under way, and might under such circumstances create a smoke problem. That report caused a great deal of concern, so further advice was obtained from the Rubber & Plastics Research Association. On the basis of their advice the material was reported as being 'safe'. A subsequent enquiry of a similar kind has arisen since the fire in France in which so many people were killed, and it is still difficult to say that polyurethane foam is 'unsafe' as a building material. The fact that it will burn if a building is already on fire does not distinguish it from timber, and it is much more difficult to start it burning.

A similarly dubious report was given in the case of sample M803, which was a Stainless Steel Butt Hinge, submitted to check whether it conformed

to specification BS 971 1950 for the steel En.58.J. The hinge conformed, but the pin on which it was mounted did not. The laboratory was not able to discover whether the pin of a stainless steel butt hinge was supposed to conform with the specification or not.

Sample M974 was a specimen of boiler sealant, submitted to discover the reason for its brittle character. It was found to contain more alumina and calcium oxide than one would find in fireclay, but it was felt that these might have been added to prevent shrinkage, and the laboratory was unable to comment on whether the material was abnormally brittle.

The next boiler sample to appear was sample M141, which consisted of brown scale scraped from inside the water jacket of an office heating boiler. It consisted mainly of Haematite (suggesting corrosion caused by oxygen in the supply water) but it also contained about two per cent of sulphate, which suggested that the water had not been kept alkaline. Three samples of water were submitted next day, these being sample E098, E099 and E100. They were from the boiler feed tank and from the condensate. All three waters were on the acid side, one of the condensates being very acid, and it seemed likely that sodium sulphite had been going into the boiler without prior neutralising. It was suggested that trisodium phosphate be added to keep to a level of about 50 parts per million in the water while enquiries were made about the possible existence of some hydrazine treatment less liable to go wrong. Later, water samples E105 from the softener, E106 from the boiler and E107 from another boiler seemed to indicate that the incoming water had not been softened, that water in the one boiler had been overtreated, and that the water in the second boiler was just as it came from the mains. The laboratory never learned what was going on however. Two of the water treatment materials which were meant to be in use, samples M152 and M153, were submitted during the course of the enquiry, and these consisted of sodium sulphite and a five per cent solution of tannin in three per cent alkali.

Sample number M232 was also scale from inside a boiler. In this case most of it was made up of calcium carbonate or "kettle fur", but once again, iron oxide which was also present suggested corrosion caused by oxygen in the feed water.

Corrosion problems on a smaller scale were found in some apparatus for heating drinking water. It is believed that the equipment is referred to as a Heatrae Boiler and may be widely used in kitchens and hostels. Samples M487 and M488 consisted of 9 mgm and 8 mgm quantities of green coloured deposit found in the bottoms of such boilers at a time when they were being cleaned. The deposits were not of uniform composition, although they contained water hardness salts and basic carbonates of copper and zinc. One deposit appeared turquoise in colour, and that one contained 39 per cent of copper; and the other deposit was only leaf green in colour, and that contained sixteen per cent of copper. The 'layered' appearance gave the impression that copper scale may have fallen into the water from some chimney arrangement above the tank, and that subse-

quently water hardness had settled on the nucleus thus provided. The water itself was not corrosive water, and there was no evidence that it was dissolving copper.

Two water samples were taken as miscellaneous samples M033 and M034 in connection with seepage into the cellar of a hotel. The report (which also referred to the water samples E086 and E087) indicated that the flooding was connected with domestic sewage, but only of a strength about one tenth of what the McGowan calculations refer to as 'weak'.

Sample M029 was water which was examined to ascertain what the livestock it contained might be. In four fluid ounces of water there were twenty 'midge' larvae, three cyclops and parts of three dead water lice. All are common in pond water, but the laboratory never did learn why the party the wee things had been enjoying had been disturbed by subjecting them to this close scrutiny. More livestock appeared in sample M034, which looked like potato peelings, but it proved to be a mixed growth of fungus made up of *Cladosporium rhizopus* and a *Penicillium*. It had been growing fairly rapidly in a cold water feed tank, and the laboratory advised an investigation to ascertain what food the fungus was living on. Jelly-like material from a galvanised iron tank, sample number M212, was at first thought likely to be hydroxides of zinc until it actually arrived in the laboratory, when it proved to be a zooglea of bacterial organisms. Conversely, when the laboratory first heard of cattle drinking white turbid water, it was a little inclined to expect that a growth of something was responsible; but the inspector brought effluent from a carpet factory which he suspected of being implicated. The factory had no idea of what the nature of the adhesives it used might be, and if truth be told, the laboratory has hardly any better idea. The sludge from the settling tanks, sample M399, contained over fifty per cent of chalk and about fifteen per cent of a latex which seemed to be a butadiene—styrene co-polymer with stiffening materials made from acrylates. The water flowing from the tanks still contained about one per cent of this latex, and it was undoubtedly getting into the cattle drinking troughs in a much diluted state.

A material which is far from easy to determine in small quantities in water is phenol. Where plant extractives are in the water the chemical tests react to give colours generally spoken of as 'phenaloid'. The W.H.O. limit for phenols in drinking waters is practically at the limits of detection of the test, so that when quantities of the order of a third of the limit were sought in samples M202 and M203 it was found necessary to take quantities of about a litre for each test in order to be sure of the nature of the colours obtained.

Professor R. Belcher of Birmingham University, speaking in Birkenhead on 15th November, stated that analysis ought to represent the best way of teaching chemistry in University because analysis is concerned with chemical reactions and chemical reactions are Chemistry. He said, however, that ever since the war, analysis has been badly taught because the people teaching it have tended to be people who have not known much about the subject . . . and instead of getting competent teachers, the

teaching faculties have thrown analysis out of their syllabuses . . . and so the chemists get worse and worse and worse. County laboratory, also tries to point out that the pressure from outside people to use ever more rapid and simple-looking test procedures is a mistake, because at some stage somebody needs to know when things go wrong. Samples M851 and M852 underlined this, because they were associated with a suspicion that a swimming pool test outfit was giving erroneous results, or that the chlorination materials were at fault. Both items were in fact in perfect condition. Had those who were seeking to apportion blame been sufficiently astute, they would not have looked only at the equipment for an explanation of the peculiar results they obtained . . . but then few people are interested in absolute purity—of truth, substance, or beauty! Sample number M237 perhaps emphasised this, because it consisted of water which was said to be being transported from another part of the country, because of its outstanding cosmetic properties. Compared with the usual water of Lancashire the water would be considered to be hard . . . though in fact, with a Hardness Value of 96, it would still be classified as Moderately Soft. No doubt somebody had noticed that hardness in a water neutralises soap, and therefore makes soap residues easier to remove from the skin. One does feel cleaner after washing in slightly hard water.

Sample M285 was rather special water which had been taken from a Post Office manhole. It was rather special because it consisted of about five eighths petrol. The amount of lead present suggested motor spirit origins, and, indeed, samples of petroleum spirit obtained from two nearby garages seemed to indicate an association with one of them. Unfortunately the laboratory seldom gets told whether its sleuthing is accurate or not so the outcome of these investigations cannot be reported.

Curiously enough, the laboratory was not asked to do any preliminary tests in 1972 in connection with the star ratings of petrol, under the Trade Descriptions Act; but two samples of petrol were submitted for examination when authority vehicles had behaved badly . . . these examinations being just to be sure that the right kinds of motor spirit had been supplied. Numbers M127 and M137 were the numbers which identified those samples. The first was suspected of being a mistaken delivery of fuel oil, but it was motor spirit, sure enough. The second sample was also satisfactory, but indirect methods of finding star ratings are not really a complete substitute for a proper Knock-Rating test in a standard Waukesha CFR test engine having controlled humidity and ice cold air intake supply—apparatus costing about £25,000. At least the laboratory is aware of this limitation, so when asked to test petroleum for octane ratings it does it by comparison tests. The comparison samples in this instance were together numbered M140, but they represented 92 Octane petrol and 98 Octane petrol purchased from one filling station which did not have an intermediate grade pump. The analytical results obtained on the specimen of 98 Octane petrol aroused the laboratory's suspicions, so some more specimens of 98 Octane petrol were obtained, as sample M144, from different filling stations selling the same appropriate brand. These were almost identical with one another and with the specimen which had originally been thought

to be unsatisfactory in use, but they were different from the specimen under suspicion.

High Octane fuel can either be fuel with a greater proportion of aromatic hydrocarbons in it, in which case one finds that the opacity to infra red light is increased, or, the required burning characteristics may be achieved by adding materials like tetra ethyl lead. Provided that the same distillation fraction of petroleum is used when the Octane ratings are adjusted by means of lead, the relative lead contents can be recognised by tests as simple as specific gravity determinations . . . but if lead and aromatics together produce the required Knock Rating, then the tests need rather more thinking about.

The results obtained on this occasion were as follows:—

<i>Sample Number</i>	<i>Rating</i>	<i>S.G.</i>	<i>% Transmittance at Wavelengths</i>		<i>Lead content (parts per million)</i>
			<i>6.23 microns</i>	<i>6.66 microns</i>	
M.137	98	0.746	22	47.5	534
M.140	92	0.728	28.5	60	240
M.140	98	0.764	19.0	45.5	376
M.144	98	0.746	26	49	534
M.144	98	0.746	25	49	534
M.144	98	0.746	24	48	534

It will be seen that the suspect petrol had relatively little lead in it, and, as the opacity at the chosen wavelengths was greater, the percent transmittance was less, indicating that the low lead content was indeed compensated to some extent by the presence of aromatic hydrocarbons. On the other hand, the amount of aromatic hydrocarbon seemed hardly enough to be likely to make the necessary difference in burning characteristics. The local inspector was alerted, but when informed of the high specific gravity he stated that it was the practice of the inspectorate itself to test petrols by specific gravity measurements, and when they were found to be high to accept that the specimens were all right. He did, however, contact the suppliers, and he reported that they confirmed that the garage concerned had been supplied from tankers from different parts of the world. For its own information the laboratory sent the suspect petrol to the Shell Refinery at Stanlow where a proper octane rating test was performed as if for research purposes. The petroleum proved to be 96 Octane petrol . . . nearer to three star, and not to the four star grade indicated on the pump.

The other tests performed in 1972 on hydrocarbon oils were less interesting, comprising a smoke point test performed for another laboratory on paraffin sample M809, and British Standards tests performed on Fuel oils, three of which were found to be Class D Burner Fuels as required (although sold under the name "35 second oil"), and one, supplied as "200 second oil", which proved to be Class F Burner Fuel—and would have had an approximate Redwood Viscosity of about 1,000 seconds

rather than 200 seconds. Sample M241 was a specimen of material submitted with the engaging description: "Sediment—which covers fuel oil in oil tank of central heating system". As might have been expected, more than half the material consisted of oil—but the remainder consisted of fungal material having entrained rust associated with it, and supported on a small amount of cotton waste. There are organisms which will live on oil residue, but one seldom finds them in a tank. When cultured on conventional media the moulds which grew from the sample culture were penicillium strains, but that does not mean that those necessarily predominated in the original culture. On the whole it was thought most likely that the buoyant 'sediment' had originally been a mouldy piece of rust-stained cloth which had fallen into the tank.

Along with the burner fuels mentioned above, which were tested for calorific value, sulphur content etc., to establish their classification, there was one sample of coal which was similarly analysed and was found to be satisfactory. In order to complete the coal analysis it was necessary to borrow the use of equipment belonging to the Electricity Generating Board. Fortunately the miner's strike had just ended otherwise the analyst might have been thumped by a picket for taking a couple of pounds of coal into the local Power Station.

Trade Descriptions Act samples began to fade into the background in 1972 as the laboratory, had predicted they would. As far as the laboratory could ascertain only two of the samples submitted under this Act in 1972 were submitted for reasons other than that members of the public had complained about them. These involved sample M228, a sample of hair setting lotion which also bore the words "Twice as lasting", and a rather peculiar item called Roasta Net, submitted as sample M405. The Hair-set Lotion was supplied in a bottle and recommended a rate of use amounting to half a fluid ounce per application. The composition of the material, namely $2\frac{1}{2}$ per cent of white shellac in perfumed 50 per cent alcohol, was similar to that found in aerosol hair sprays, and since few people would apply half a fluid ounce of the basic lotion from a hair spray it was felt that the recommended rate of application was so much greater than normal that the words "Twice as lasting" might not be misleading. The Roasta Net was a tubular length of netting the diameter of which could be extended because the lateral cords were made of elastic material. The longitudinal cords were made of cotton and the elastic ones were made from a poly butadiene rubber covered in regenerated cellulose material resembling Rayon. The cords retained their elasticity at normal oven temperatures and there was very little browning of the cellulose at those temperatures. The rubber contained about 0.75 per cent of zinc which did not extract into wet or fatty food and there were 16 parts per million of copper in the materials, but these also seemed to be fixed. It seemed that the item was sold for the purpose of holding pieces of meat in a good shape during oven roasting, and it certainly seemed capable of doing this.

The complaint samples submitted under the Trade Descriptions Act were as follows:—

- Samples M983 and M014 Chicken Chow Mein. These were pre-packed ready-prepared meals which were underweight because the bean sprouts which were meant to be present had been omitted from the meal. The inspector originally intended to prosecute but appreciating that there had been no intent to deceive he later changed his mind.
- Sample M002 Date Stones. No doubt the simplest concept of a misleading label was associated with this complaint. The sample consisted of date stones. An old age pensioner had found them in a packet labelled CHOICE STONED DATES.
- Sample M989 Green Cuprinol was thought to have been diluted. Its composition, namely 93.5 per cent kerosene, 6.5 per cent copper naphthenate amounted to a total copper content of 2.3 per cent. Comparison samples of the preparation were found all to contain 2.3 per cent of copper.
- Sample M001 Domestic Bleach was said to have caused unsightly burning on the skin of a user, but the specimen had the same composition as independently purchased bottles of the product, being sodium hypochlorite of available chlorine content 9 per cent and cationic detergent one per cent. The bottles bore a warning: "CAUTION—Wash off accidental splashes of undiluted Domestos promptly. If in the eyes or on the skin wash immediately in water. If swallowed, drink plenty of water". It was found that three minutes' contact with the skin produced a tingling sensation which prompted remedial action, and it was felt that the only reasonable criticism might be that the warning was not printed sufficiently boldly.
- Sample M475 was Cloudy Ammonia. This was believed to have damaged the hair of a person who had used it with hydrogen peroxide for bleaching her hair. It repeatedly comes home to a person who has studied chemistry that nothing in a formal course of chemistry training is of any practical use whatever. If one wishes to know about any application of chemistry one needs to go to the people who commonly apply it. There was nobody in County Laboratory with any knowledge even of the strengths of peroxide and ammonia used for bleaching hair—so information was sought from the hairdressing department of Blackburn College of Technology and Design. From them it was learned that normal application rates are two drops of 0.880 ammonia to 2 ounces of 20 vols. hydrogen peroxide but that if 60 volume peroxide is used then a smaller proportion of ammonia

is required, namely four drops to six ounces. Greater alkalinity, they said, led to reddening of the hair. It must be confessed that in County Laboratory we are afraid of 60 volumes hydrogen peroxide, and would half expect that such a strength used on hair was liable to explode. However, the hairdresser did say that she would not herself use peroxide at strengths exceeding 30 volumes. She also warned that ladies used Calcium Oxide pads for stripping and cleaning hair, and that one should never use ammonium thioglycollate perms on hair which had been tinted. She said that hair which had been bleached once or twice a week over a period of six months becomes brittle anyway.

As a result of all this information about women's crowning glory it was felt that the most unmentionable thing about the musical show which has run so successfully for five years is the chemistry involved in keeping voyeurs interested in the subject. The cloudy ammonia consisted of 10 per cent ammonia made up in hard water to which about 0.05 per cent of soap had been added. It was the least dangerous chemical to have been mentioned in the whole discussion.

Sample M035

was another hair-dressing preparation, this time for mens' hair. It was blue jelly said to have caused a rash when used. It proved to be a polyethylene oxide material 50% mixed with glycerine 5%, and water. Ethylene oxide polymers are a common starting place for the manufacture of non-ionic detergents so the laboratory was willing to believe that such material might cause a rash, but no member of the laboratory staff could generate a rash by applying the material to his skin.

Samples M558 and M559 were samples of canned Dog food which were said to have been associated with the death of dogs. Apart, however, from the usual criticism that only half the contents of the cans consisted of food, there was nothing chemically or bacteriologically unsound about them. Dogs eat anything if they are hungry. It would not be ridiculous to suggest that if they were hungry enough, the rest of the affected pack might have started eating one another. It is interesting to recall that a man died at the end of June in Hornby, from the disease Leptospirosis, which can penetrate the skin from rat urine or from the licking of dogs which have been engaged upon ratting for rats which are suffering from the disease. The risk from dogs is probably greater than the risk of being poisoned by lead in the modern environment. It is also interesting to recall that in 1972

the newspapers told us that whereas it costs only £1·20 to feed a man in prison, it costs twice that amount to feed prison dogs. If half of all pet food is extraneous water then the difference in costs is simply being poured down the drain. Dogs are an expensive hazard we could probably well do without.

Samples M272 to M275 inclusive, were said to be connected with the death of pigs. These were samples of Barley. The suspect sample itself did contain nearly one per cent of weed-seeds—almost all hemp-nettle—which may have accounted for the low price which had made it suspect, but the other three samples were Canadian Barley, New Barley dried at the corn mill, and New English barley direct from the farm. All but the new barley had moisture contents between $9\frac{1}{2}$ and $11\frac{1}{2}$ per cent and the germination tests proved to be as follows: Suspect 18 per cent, Canadian 91 per cent, Mill dried 93 per cent, New Farm Barley 55 per cent. The last three results were normal since there is inhibition of germination in new barley. It did rather look as if the suspect barley was from the current year and overheated during a process of artificial drying. There was another indicator which pointed in the same direction. This was the fungal count. The fungal counts were as follows: Suspect 2,000 colonies per gram, Canadian 168,000 colonies per gram, Mill dried 36,000 colonies per gram, New Farm barley 8,400,000 colonies per gram. A Mr. Lawrence of the Animal Husbandry Division of Liverpool University Veterinary Investigation Field Station, Neston was consulted and he agreed that there was a strong belief that new barley was undesirable for pig feeding but that no actual feeding trials had ever demonstrated that it was harmful. No poisonous substances were in the grains and the laboratory felt unable to comment on whether the material was unfit for feeding purposes.

Sample M145 was probably some material called Camgel which had been demonstrated on B.B.C.'s Tomorrow's World programme as an effective means for removing spray paint lettering on walls, etc. A specimen of Camgel was obtained and it was found to be very similar, but what its composition was defied ordinary analytical processes. About 93 per cent of the product consisted of solvents, but they were maintained in a jelly-like material which had surfactant properties. The infra red spectrum showed ether linkages, and on heating the material, ammonia was given off. Once the solvent had been removed the material was soluble in water, but other-

wise it seemed to be absolutely insoluble . . . yet the original gel dispersed with water to produce a stable white emulsion. The laboratory ended up with only half an answer. The solvents seemed to be White Spirit 33 per cent, Butyl acetate 20%, Isobutanol 10%, Water 6% (including ammonia $\frac{1}{2}$ per cent) in a poly olefin glycol surfactant. What this last material actually was, however, remained a mystery. The County Painting staff experimented on behalf of the laboratory with some messages which had been lingering on the walls of County Hall for some months, and their verdict was that it was all right for removing very newly applied spray paint marks, but that older lettering responded better to ordinary paint thinners.

Two prosecutions were instituted under the Trade Descriptions Act. One concerned a motor service in which an oil filter change had been charged for and the other concerned saucepans sold as vitreous enamel saucepans with stainless steel. The samples involved were:—

Samples M208 and M209 which were the oil filter from the serviced car and a specimen of the undersealing compound which was said to have been applied to the oil filter when the whole new car had been undersealed. The small amount of material on the filter was easily shown to be identical with the underseal material, but the case was dismissed when it was taken to court, because instead of prosecuting the firm, the prosecution tried to prosecute the individual concerned, and was unable to establish that he in fact was the person responsible.

Sample M595 was a saucepan with lid in which no stainless steel whatever had been used. The “vitreous enamel” finish proved in fact to be a poly imide resin paint, which had been applied to an aluminium saucepan. The pan had been coated inside with PTFE. The advertising relating to the pan is shown in plate 37. The firm offering the pans was fined £50 + £23 Costs.



PLATE 37 Saucepan advert

Twenty-seven toys were examined under the Toys (Safety) Regulations 1967 made under The Consumer Protection Act 1961. A few of these appeared because of complaints which had been made, but of the routine samples fifteen were quite unexceptionable. In case reference needs to be made to them their numbers were M794, M411, M412, M414, M415, M419, M464, M465, M466, M467, M468, M469, M480, M481, M567 and M568. The other specimens deserve the following comment. Sample M782 was a Kelly-type Mickey Mouse submitted because it was feared that the filling might be toxic. The filling was a very weak mortar of $2\frac{1}{2}\%$ cement and 88% sand and 6 per cent shell (the remainder was moisture). The paints—all that is actually covered by the Toys (Safety) Regulations—were perfectly satisfactory. Samples M796 and M834 were follow-up samples which resulted from a newspaper comment on a sample examined in the previous year. They were certainly from the same batch of toys as had been examined in 1971, and although the paints were not satisfactory there was so little paint involved, that it was felt unnecessary to do more than withdraw remaining stocks. Sample M822 was a stuffed toy dog with a plastic squeaker inside it. No cellulose nitrate had been used in its manufacture and the plastic furry fabric from which it was made consisted of a polypropylene-polyisobutene polymer. The filling was Terylene mixed with cotton, but this filling contained more chloride than the Rag Flock Act would have allowed. Neither the inspector nor the laboratory, however,

were authorised under the Rag Flock Act. Sample M907 was a broken rattle inside which a mother had found seeds, which made her wonder whether they were poisonous seeds. They are shown on plate 38, and they proved

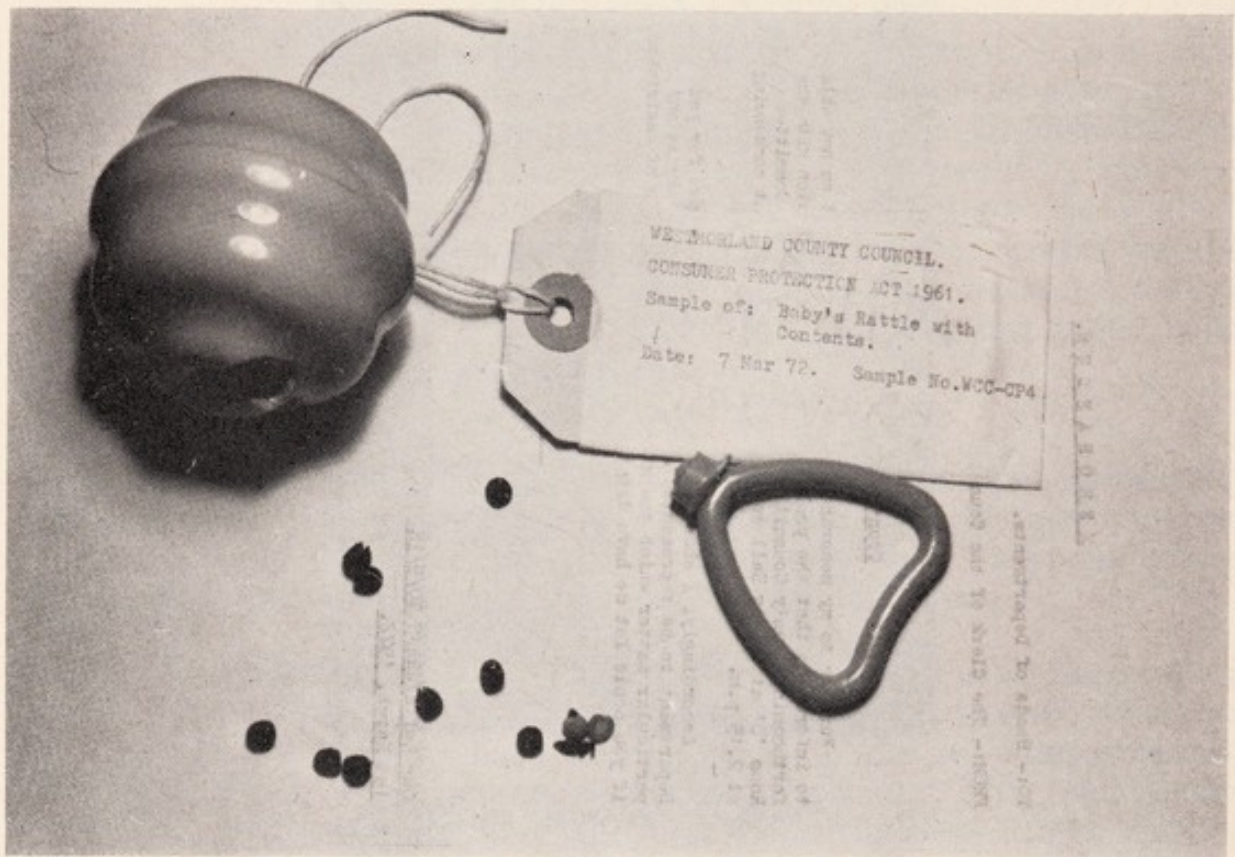


PLATE 38 Rattle

to be Vetch seeds—commonly used for such purposes. Sample M964 was a set of 20 cubes and dowels in which two of the sides of half the cubes bore stencils of animals. Five colours had been used and one of the colours contained a slight excess of soluble cadmium. Sample M129 was another rattle in which a mother declared that the filling consisted of sharp pieces of metal. The rattling particles were in fact pieces of chalk and balls and chips of polystyrene. Some of the polystyrene *was* rather angular. Sample M150 was a toy train made of variously stained pieces of wood covered with varnish. The red stain was the water soluble colour Rhodamine B which was one of the earliest red dyes to be prohibited from use in food. Sample M420 was a printed metal drum in which the yellow colour contained about 80,000 parts per million of lead. Home Office Circular 12/69 acknowledged doubt about whether inks used on printed metal toys really are 'paints' for the purpose of these regulations so the toy was not withdrawn from sale. Mr. Henderson—(Home Office 01-834 6655 Ext. 199) stated that a draft of new regulations was now due, which might clarify the position of printed tinsplate in the Toys (Safety) Regulations. Sample M462 was a wooden lorry made up from twelve painted shapes of which three were painted green. The green paint contained more lead than the prescribed limit and the inspector decided to prosecute. The case was due to be heard in April and was adjourned until May. In May it was

adjourned until June. If it is resolved before this report goes for printing the result will be added to the general prosecutions table.

Finally sample M549 consisted of a novelty sold as a Trick Smoking Monkey. The bag and the monkey were made of plastic, free from cellulose nitrate, but the cigarettes the monkey smoked consisted of one millimetre diameter rods of cellulose nitrate, containing 8.4 per cent nitrogen, wrapped around with paper. Plate 39 shows a nice infra red trace from the

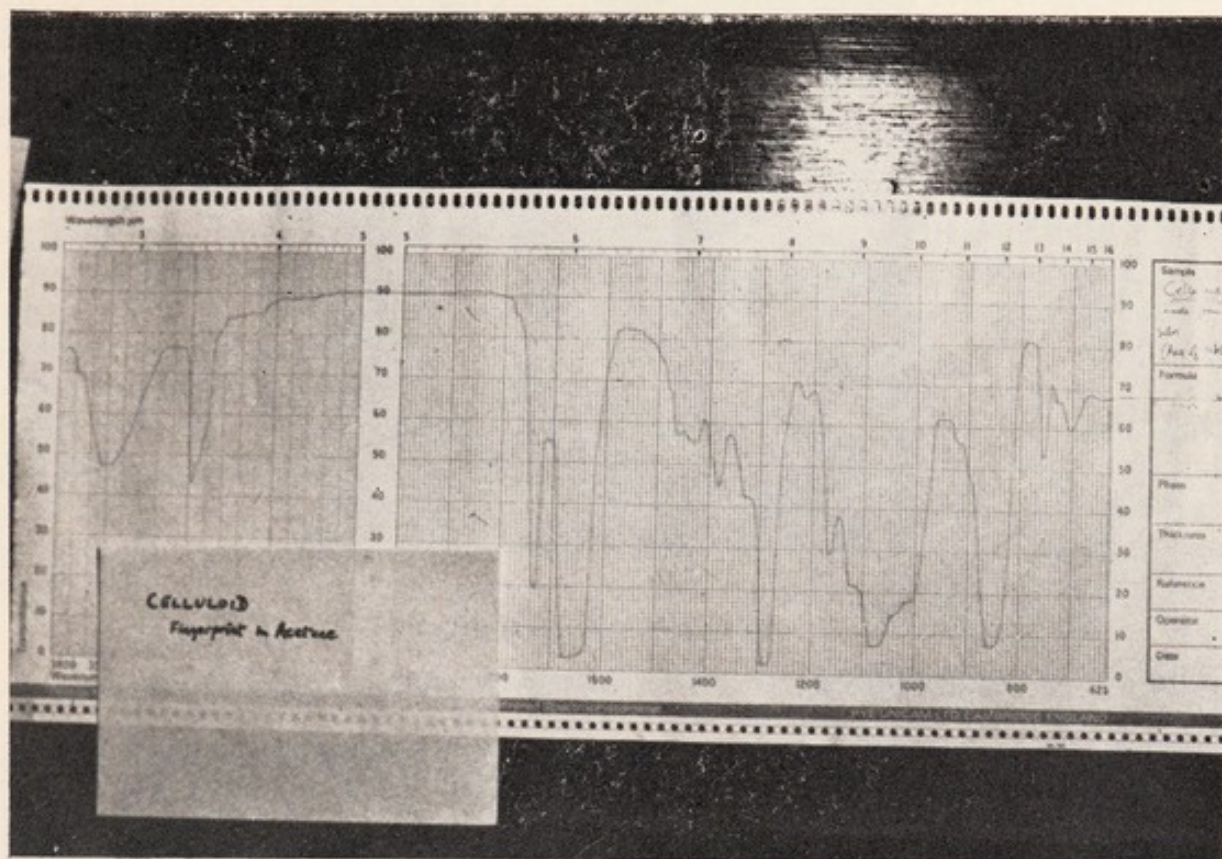


PLATE 39 Celluloid

rods. All six rods weighed only 0.3 grams and the laboratory reported the opinion that the sample was not a "toy" in the ordinary sense, but a firework. The toy portion (namely the monkey-shaped plastic support for the firework cigarettes) was certified free from the prohibited cellulose nitrate, but the shopkeeper nevertheless withdrew the remaining stock from sale and the inspectorate notified the Home Office.

The idea of poisonous metals having an adverse effect upon people, led to the submission of nine further samples. Thus samples M805, M817, M818, M819, M841, M842 and M843 were metal measures for insertion into the top of a bottle in order to dispense measured quantities of drinks. Sample M820 was a spirits optic which was also submitted in order to ascertain whether the metals were likely to contaminate the drinks. The investigation followed up a notice in Municipal and Public Services Journal for 12th November, 1971 on page 1558, that Westminster City Council had asked Public Health Inspectors to look out for metal dispensers on bottles of citrus drinks, and some were sent with the drinks as shown in



PLATE 40 Drinks Bottles

plate 40. If the colours are not lost in the conversion from a colour slide

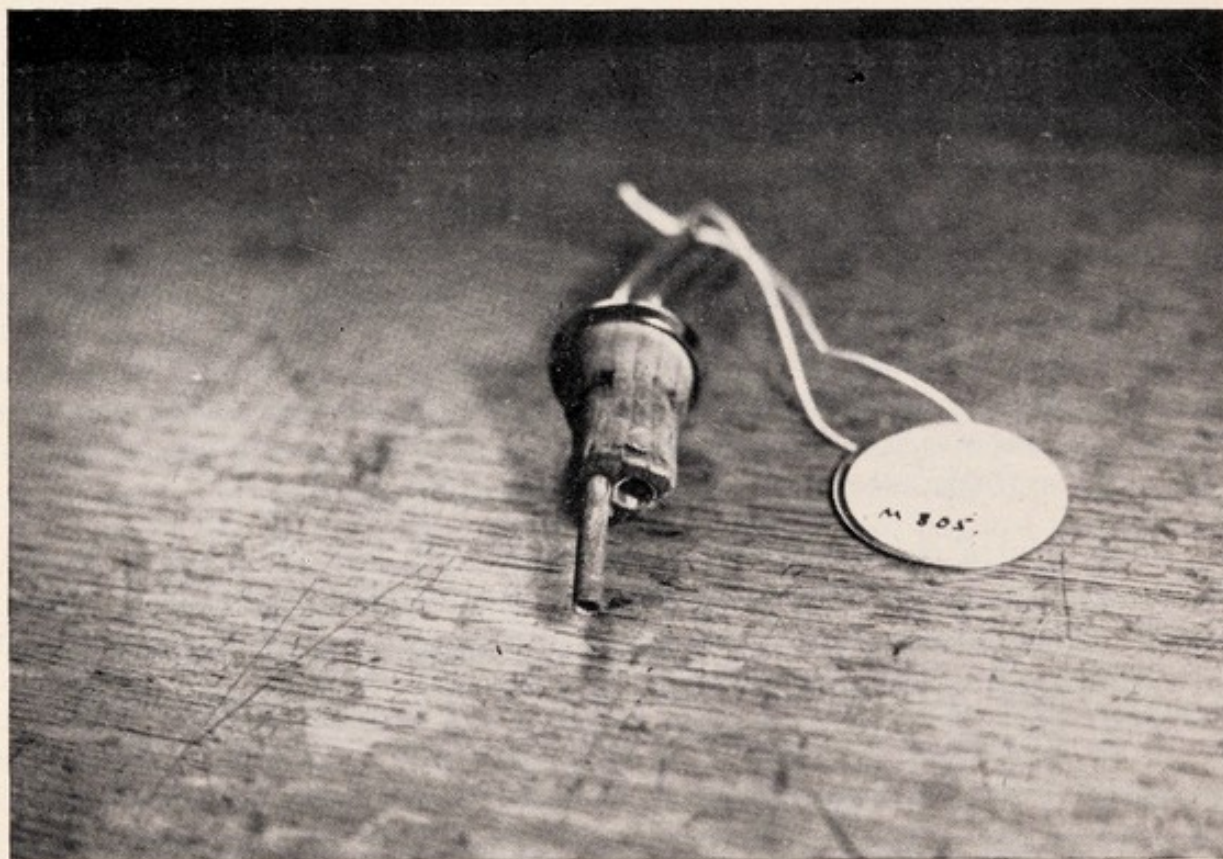


PLATE 41 Pourer

to a black and white print, the degree of corrosion will be seen in plate 41, the corrosion products in that case having a metals content approximating to $11\frac{1}{2}\%$ copper, 10% nickel and 4% zinc. All the samples submitted came from Whiston R.D.C.

The test solution recommended in the 2nd Report of the Main Technical Committee of the British Plastics Federation for this kind of investigation is 5 per cent Citric Acid, but such strong acid was felt to be unrealistically strong and the laboratory chose one per cent citric acid to simulate cordial intended for dilution. With the pourers the procedure used was to pour a sixth gill of the solution through the pourer and allow the pourer to dry overnight, and then to pour one further gill of the solution through the pourer and analyse that for metals. The procedure brought out about five parts of copper and four parts of zinc in a million parts of the liquid. The amount of nickel which came out was only of the order of half a part. The procedure with the optic was different. It was rinsed with the one per cent citric acid solution and then left filled overnight. It was then refilled and allowed to stand for one hour. Then it was refilled again and allowed to stand for 22 hours. The results suggested that the first contact with citric acid was stripping off existing corrosion products and the metals found were in very large quantity. The subsequent washings were still appreciably contaminated however, producing dissolved copper in the region of 30 parts per million, dissolved nickel in the region of 20 parts per million and dissolved zinc in the region of 15 parts per million.

The drinks which had been associated with the pourers when the inspectors picked up the various bottles, were examined after being poured through the pourers, and all except a Campari contained dissolved metals. Thus Sirop de Gomme contained 14 parts of copper and 20 parts of zinc, a Peppermint Cordial contained 30 parts of copper and no less than 180 parts of zinc, Lime Juice Cordial contained even more copper, namely 120 parts. The wines and spirits, however, were nothing like as aggressive. Dry Vermouth contained 14 parts of copper and 12 parts of zinc. Rum contained 10 parts of copper and 8 parts of zinc, and Martini had dissolved only nickel. It might not always be correct to assume, however, that Campari is the one drink which does not answer to the affectionate appellation 'Rot-gut'. The age of the pourers may have been a factor in the results obtained.

The idea of poisoning by metals extracted from food handling utensils was also behind two specimens of cooking vessels submitted for examination. One of these was an Austrian stewpan, sample M578, made of enamelled steel, and it was subjected to the over-rigorous extraction process suggested in BS4860, but no toxic metals came out of it. The other sample M289, was a very decorative copper saucepan with lid, which had been tinned inadequately inside so that mashed potatoes which were submitted inside it when it came to the laboratory were stained blue. Those potatoes contained quantities of copper ranging from nearly 5000 parts per million in the bluest areas to only 35 parts in the least affected area, but the whole mass contained 350 parts compared with the recom-

mended general maximum of 20 parts for unspecified foods. There were no means of telling how long the potatoes had been in contact with the metal however, so the laboratory cooked some more potatoes in the pan. If removed immediately after cooking those potatoes contained only 2 parts per million of copper. If allowed to stand in the pan after cooking for a period of one hour, the copper content increased to 16 parts per million. Colouring of the kind seen in the complaint potatoes did not occur until after two days standing time. In that time potato in contact with the aluminium rivets which held the handle in place turned grey, and the grey area was found to contain 11700 parts of aluminium. Should a pan be banned because it can be misused in such a way? Should rope be banned because it is possible to hang one's self with rope? One other housewife suddenly had misgivings about a pan which was submitted as sample number M539 and consisted of a non-stick fry pan containing chops covered by an oven glass plate. The plate had a film of black on its underside and evidently it was suspected that the black non-stick finish was volatilising. In fact the chops were being cooked in a sauce which included tomato and Worcester sauce, and the acidity in the sauce had decomposed sugars in the tomato which had sublimed on to the plate. The black finish on the pan was, of course, the usual totally inert PTFE non-stick finish which would have been harmless even if it had become detached from the pan.

The idea of poisoning appears to have occupied the popular mind to an almost morbid extent in 1972. Only one sample, sample number M292, actually consisted of food suspected of having contained added poisons. The ingredients of the suspected meal were milk, clotted cream and black treacle . . . which sounds like the poisonous sort of mixture indulged by Health Food addicts. No doubt the complainant's stomach had been in rebellion against the things her mind had considered should be good for it, because no conventional poisons were present. Next, the police caused a local authority to submit a yellow powder, sample M133, which was reputed to have been laid in a public street for the purpose of killing dogs. Twelve were said to have fallen victim to it. In fact it consisted of compound mustard powder. Another sample of powder found on a roadway, sample M230, proved to be expanded aluminium silicate, a material used in the building trade for purposes of insulation. There were also two samples submitted by the Prison authorities. One, sample M155, appeared to be suspected of being a dangerous drug, but it was in fact sodium bicarbonate . . . possibly used as an indigestion remedy. The other powder sample, number M046, had been causing discomfort to people unloading goods, the powder being upon the pallets on which the goods were stacked. This proved to be a cleaning powder containing sodium silicate and sodium carbonate and would undoubtedly have been unpleasant as dust.

The most extraordinary poisoning scare of the year was the one concerning "Ladybird Seeds". It appears to have started in Bristol, where a door to door pedlar was giving the seeds to customers as a "Good Luck" token, and when they were sent for identification somebody happened to mention that they contained poison. The same might be said about so

many seeds that one would have expected the observation to go wholly unnoticed. Black Bryony, Buckthorn, Cuckoo pint, Ivy, Laburnum, Thorn Apple, Yew and even Privet seeds are all mentioned as being poisonous in The Pharmaceutical Society's "Poisonous Plants and Fungi" by Miss Pamela North. The "Ladybird Seeds" have a coating which resists the action of gastric juices, so the danger is not so very great. The particular seeds which are botanically named *Abrus precatorius*, are very recognisable, as will be seen from plate 42 and the inspectorate took a very



PLATE 42 *Abrus*

sensible attitude, carrying a few comparison seeds about with them and themselves heading off most of the enquiries. The necklaces and other articles which did reach the laboratory were therefore only those about which some further enquiries were being made . . . for example some of the costume jewellery was forty or fifty years old and the owners wondered whether the poison was still active, some had been "treated" (probably roasted) to render the seeds harmless, and other necklaces were mixtures of seeds. The seeds were tested by a Urease test and by a simple blood agglutination test—grinding a few of the seed samples with normal saline and adding a drop of the supernatant liquid to 10 per cent blood in normal saline in a test tube, and then looking for agglutination of corpuscles microscopically. The laboratory used Cashew as a control because cashew was available, but a control was hardly necessary. The Royal Botanic Gardens, Kew, helped with seeds which were not readily identifiable from the literature, but some of the seeds (sample M111 for example) had been mutilated and artificially stained, and these defied identification even by

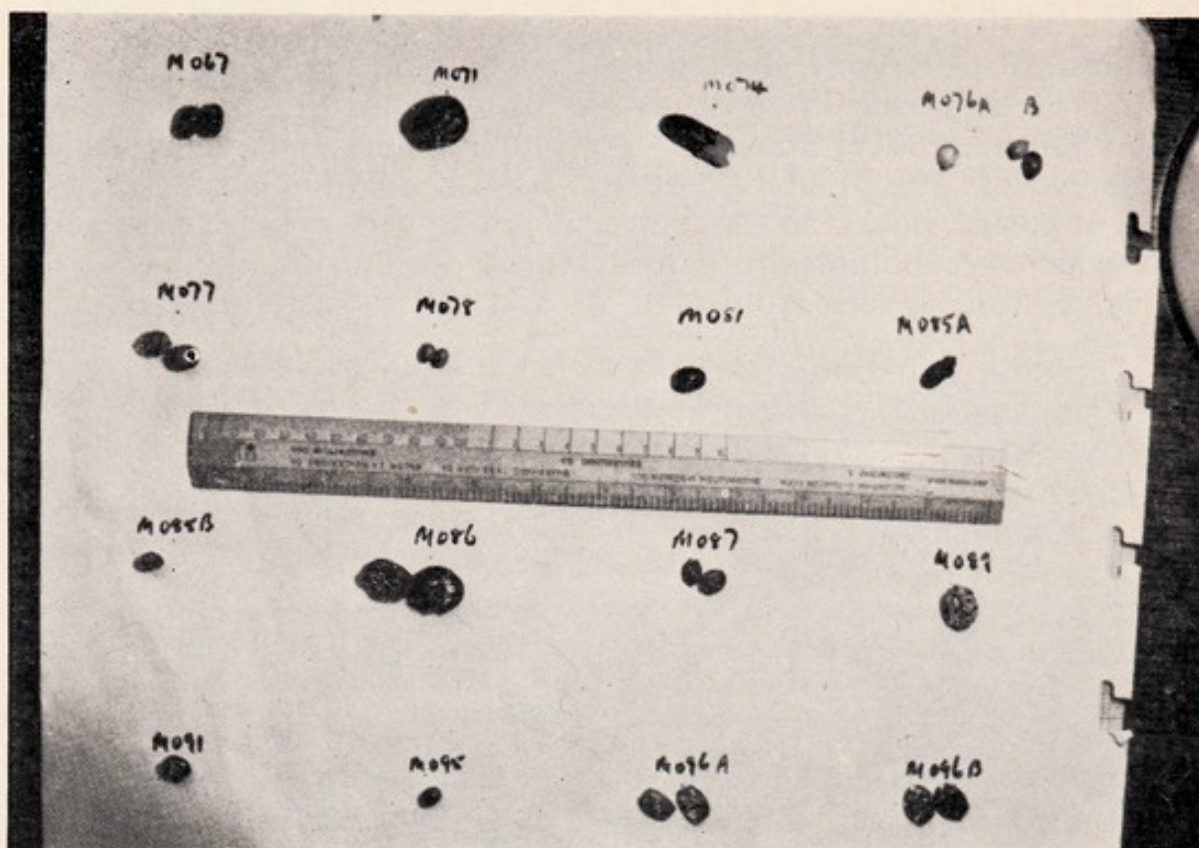


PLATE 43 Seeds

Kew. Plate 43 shows some of the seeds encountered. M067 was not identified by Kew, M071, M089 and M091 were varieties of *Castor*, M074 was *Afzelia*, M076 A & B were the grass *Coix lachryma*, M077 was *Elaeocarpus*, M078, M081 and M085 B were varieties of *Erythrina*, M085A was not identified, M086 *Ricinodendron*, M087 *Melia azedarach*, M095 a *Vicia* sp., and M096A and M096B were not identified. A later seed, not illustrated, was *Ormosia*. *Castor* seeds and *Ormosia* seeds are also poisonous, the latter containing an alkaloid, ormosine. It is to be hoped that saying so will not start another deluge of beads like that of 1972. *Erythrina* seeds also contain an alkaloid, but that is one with curare like action which does not take effect when the seeds are eaten. Even with the active co-operation of the inspectorate the laboratory still had some seventy items to examine, under thirty-seven numbers. It would, even so, have required at least twice as many of these symbols of fecundity to make the Venus in plate 44 appear to be beautiful. Perhaps a more comical situation arose with necklace sample M282 which was treated seriously as

a specimen for seed identification, even by the laboratory, before it was realised that the "seeds" were made of polystyrene.



PLATE 44 Venus

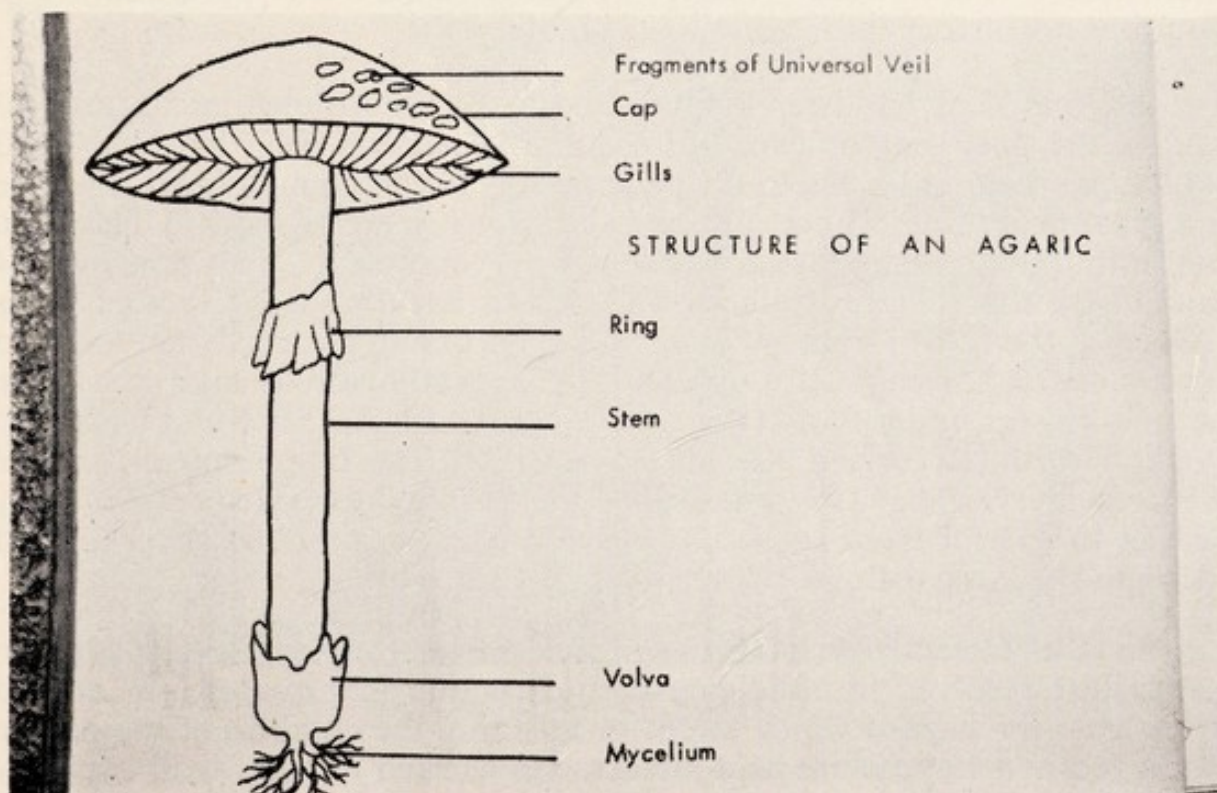


PLATE 45 Mushroom diagram

The possibility of poisoning by toadstools was raised again in 1972 with sample M383, which was said to be fungus which had appeared extremely quickly on lawns where children played. They are of interest in one or two ways. First, some years ago the Pharmaceutical Society issued two rules of thumb about eating fungi. One was that if it grew in shady woodland it would be wiser to avoid eating it. Plate 45 shows a diagram of mushroom structure which might originally have been one made by the Pharmaceutical Society, but it is useful in setting out their second rule . . . "*Avoid eating any fungus which has both a ring and a volva*". Having said this however, it is wise to emphasise what Pamela North says on page 9 of her attractive little book, namely, that whereas the Ministry of Agriculture and Fisheries Bulletin No. 23 states that there are only nine poisonous British Species, an earlier authority, Ramsbottom, states that there are 25. The specimen examined in this case might account for one of the uncertain sixteen, since it was *Armillaria mellea* or "Honey fungus", which is said to be sweet and non-poisonous but very rich eating and liable to cause acute indigestion. The fungus grows on wood, so its appearance on a lawn seemed unexpected until it was learned that a large tree had recently been felled and that the roots were near the surface in all the affected area.

Samples M979 and M980 were specimens of grass which were examined for iodine content, the quantities found being about 120 parts per million parts of the dry matter, and sample M978 was an associated powder concerning which there was some question of whether it was thyroid extract. It certainly was dried glandular tissue containing nearly 0.1 per cent of iodine but it seemed to amount to only about one third thyroid. The examinations were performed for another public analyst and the laboratory was not really acquainted with the reason. Much the same might be said about three urine samples in which the mercury content was determined. The amounts found were 0.006 ppm, 0.007 ppm and 0.018 ppm but no further information is available.

A great deal has been written about the environmental hazards of lead in the past year or two, but much of what has been written would sometimes seem to be due to the press having found an area in which there is a great deal of ignorance, just at a moment when Messrs. Rio Tinto Zinc ran into public relations difficulties in Avonmouth. The Borough of Southwark then demonstrated a lead fallout hazard from a factory in its area, and then the Department of the Environment, early in 1973, issued Circular 6/73, and called upon Public Health Authorities to take advantage of their powers under Part III of the Public Health Act 1936 and under the Public Health (Recurring Nuisances) Act 1969. The Employment Medical Advisory Service Act 1972 established the Employment Medical Advisory Service to operate from 1 February 1973, and then that body also expected to begin its work with an Environmental Lead Survey.

In the interim period, a District Medical Officer of Health in Lancashire resolved to anticipate the instruction in Circular 6/73 and to investigate the hazard which might be affecting the children of the people employed in a Lancashire lead factory. He worked initially with capillary blood, and County Laboratory undertook to do the necessary chemical

analyses. The results of the survey have been reported elsewhere, but the laboratory may usefully state that there is so much difficulty in the original stages of a project of this kind that it is possible to suspect that at least some of the alarmist statements made in the early days of interest in lead levels in blood could very well have been due to analytical difficulties. An admission that there were difficulties was implicit in the paragraph on page 279 of the Lancashire Analyst's 1971 Report, when the lead content of motorists' blood was mentioned. The problem is this. If reliable chemical procedures are to be used, then relatively large amounts of blood are needed. If one proposes to take samples of children's blood, one tries to take small samples which involve a minimum of discomfort and alarm. Small samples of liquid blood tend to clot and then they cease to be wholly suitable for the highly instrumented method of analysis which becomes necessary when one seeks a few millionths of a gram of lead . . . but if one adds chemicals to the blood in order to keep it fluid one changes the rate at which lead is released from the blood in the burning process involved in the analytical method. It had been hoped that most of the difficulties could be overcome by applying small quantities of the blood being sampled to a clean filter paper, and then allowing it to dry. In this way a second difficulty—that of transport is also resolved.

There proved to be two snags in this. The first one will be appreciated from referring to plate 46. When blood is properly applied to the filter



PLATE 46 Blood Spots

paper, both the top and the reverse side of the paper look evenly loaded like the spot on the right of the picture. A less expertly applied spot does

not soak right into the paper, and the back of the spot looks like the one on the left hand side of the picture. This blotchy appearance means that when equal sized portions are punched out of such a spot, one takes different sizes of sample in terms of actual blood.

The next problem is all the same one, even though it may sound more complex in the explanation. It is that the lead in the sample spots can only be deduced by comparison of measurements made on the sample and on a similar blood specimen which contains a known amount of lead. The rate at which the lead is released has already been stated to be affected by differences in the amounts of inorganic salts which may be present for preservative purposes, but it is also affected by differences in the blood. An early attempt to use as the standard some leaded blood from pigs' blood, sample M119, was therefore quite useless. In any case it already contained 120 micrograms of lead per 100 mls of the blood (or 1.2 parts per million). A very small sample of child's blood, which had been taken for other purposes and had been intended for discard, was made available to the laboratory as sample M790, and, as this contained very little lead, further quantities were sought from that source as suitable reference material; but the subsequent specimen, sample M409, together with one obtained (thanks to the good offices of the Blood Transfusion Service as sample M124), was found to have been diluted and chemically treated in order to keep it fluid, so that the bottles contained, not blood, but 2 grams of disodium citrate, 3 grams of dextrose, 120 mls of water and only 420 mls of actual blood. The effect of this dilution was to make the blood spots on filter paper non-characteristic, so that the blood loading was wrong. If attempts were made to relate the lead in blood to a mere aqueous solution of lead, the rate of volatilisation of lead in an atomic absorption spectrophotometer was found to be approximately three times as great from water solutions as from blood solutions. The readings in the survey were made by using a reference lead made by adding to the appropriate volume of blood in a Delves cup, a measured quantity of Standard lead solution. Even so, there was reason to suspect that because there had not been any intimate mixing before the reading was taken, the selective volatilisation problem might still have been producing a possible error, estimated as being capable of being as much as fifteen per cent of the reported levels.

As if this train of excuses were not enough, the first sampling of children's bloods revealed another hazard. The children were all duly cleaned up for sampling purposes, but the time taken to obtain the samples extended over a period of about an hour, and subsequent sampling showed that at least some of the children had contaminated themselves with a few millionths of a gram of lead during that period. How easily this can be done was shown in an early "guinea pig" experiment in which your analyst took blood from his own thumb, assuming that the wash he had given his hands half an hour before was sufficient precaution against external contamination. He was surprised to get a reading of 48 micrograms per 100 mls (or 0.48 parts per million). So another sample was taken after a scrub up, when a true value of 26 micrograms was obtained. Other laboratory members had levels ranging from 20 to 27, and the Transfusion Service and other bloods had quantities ranging from 15 to 26.

Of the first 44 capillary blood samples, M348 ff., which had been liable to contamination when samples were taken at the works, there appeared to be 6.8 per cent in excess of the adult "safe limit" of 80 micrograms per 100 mls. The results were as follows:—

<i>Lead Micrograms/100 mls. Range</i>	<i>Number of Occurrences</i>
31—40	8
41—50	10
51—60	10
61—70	12
71—80	1
81—90	2
91—100	1

Another set of 31 samples taken at the clinic, where there was less likelihood of contamination, and numbered M426 ff., gave a different pattern of results altogether:—

<i>Lead Micrograms/100 mls. Range</i>	<i>Number of Occurrences</i>
11—20	5
21—30	19
31—40	4
41—51	3

The children examined in the first survey were re-examined with a few others at the clinic and the pattern in samples M489 ff. looked far less alarming:—

<i>Lead Micrograms/100 mls. Range</i>	<i>Number of Occurrences</i>
11—20	4
21—30	23
31—40	13
41—50	6
51—60	3
61—70	1

In 1973 some further samples were taken which led to the conclusion that venous blood samples are easier to deal with, and some of these further samples also produced some relatively reassuring agreements with results obtained by another laboratory which was using larger samples. Our conclusion therefore, is that the above results are probably within fifteen per cent of the correct answers except where fortuitous contamination of the samples occurred.

The Employment Medical Advisory Service shows concern only when blood levels in people working in Factory Act premises exceed 120 micrograms per 100 mls, but most people seem to be taking 40 as a reasonable maximum for children. As far as this laboratory can discover however, that figure seems to be one taken, like a conjurer's card, out of thin air. There also appears to be evidence that children's blood levels can fluctuate, so it would be a courageous parent who allowed his child, in the present state of knowledge, to be medically treated to combat excess lead in his blood.

It will be seen how many of the miscellaneous samples in 1972 were examined with contamination in mind, and of course, some foods were investigated from the same point of view. In most cases these are dealt with in the appropriate food sections of the report, but one or two of the food samples may be mentioned among the miscellaneous samples, because they do not fit conveniently into the categories into which the report has divided the samples submitted. Thus M870 was a series of fourteen samples of different kinds of milk in which lead was determined in order to get some idea of what lead levels might be occurring in milk. The results obtained were fairly uniformly of the order of 0.0025 parts per million (or 0.25 micrograms per 100 mls.) Two samples of Frozen Squid were submitted as samples M849 and M932 in order to provide certification for the Italian authorities that the fish contained less than 0.7 parts per million of mercury. Until they had such certification they would not import it. Squid does not look particularly edible but no doubt Britain will also be required to acquire a taste for it now that Europe is united. The amount of mercury present was very acceptable, being only in the region of 0.1 part per million.

Grapefruit juice sample M839 and Tomato juice M483 were both "complaint" samples which had been purchased privately and thought to have metallic flavours. In each case the juice had been stored in the opened can but neither was particularly contaminated. Nevertheless, follow up samples of the same brands indicated that the foods were acceptable when sold.

Concern about contamination caused sample M355 to reach the laboratory. This was a sample of Honey and some red and black material said to be the Propolis or sealing compound the bees had used to seal the comb. Propolis is usually resin from conifers, Horse-chestnut gum from the sticky buds, and other natural resins which the bees use to eke out wax when they are capping honeycombs, but it is very common for bees to pick up new paint and they take tar from roads in very hot weather. The bees had been doing something of the sort on this occasion, because their Propolis contained 9.1 per cent of lead, clearly derived from red lead, but other paint pigments were in the 36 per cent of mineral matter present and almost 30 per cent of the material was beyond analysis, consisting of mixed polymerised material which seemed to be of synthetic origin. There was also three and a half per cent of bitumen, two and a half per cent of

resin and the rest was beeswax. It is nice to know that even the paragons of industry are not above taking a few short cuts. The honey was virtually uncontaminated.

The same could not be said about some bacon which came as sample M991 from the port together with some of its hessian wrappings. The wrappings had been drenched with Derv oil.

Sample M853 was a different kind of contaminant. It was nothing but part of a broken tablet, and it was said to have been found in a restaurant meal. It can be extremely difficult to identify part tablets, so only part of its composition was discovered . . . this being Benzocaine and sugar. It did have cooked potato starch adhering it, so it probably had been found as described. A statutory certificate was issued, suggesting that it had probably been a throat lozenge, but the case was not taken to court.

The inspector concerned suspected that a deposit in a sample of brandy, sample M417, may inadvertently have been introduced by the elderly person who made the complaint about it—so he submitted that sample as a miscellaneous one. The deposit consisted of partly digested biscuit, and it was suspected that perhaps it was material from under false teeth, which also implied that the person who unknowingly had introduced it to the brandy may have liked taking little 'swigs' direct from the bottle.

Some of the contaminating materials submitted under M numbers consisted of nothing but the foreign materials themselves, so that although it was said that they had been derived from corned beef, or pies or canned foods, nothing to corroborate such statements remained. A piece of concrete, sample M142, said to have been from corned beef, various pieces of bone, (samples M826, M149 and M215), one or two other biological specimens, (samples M108, M344 and M049) were examples of this. It is a curious reflection on the morbid nature of people that a small bone in an unexpected place brings them out in haddabs for fear that it may have been derived from a rat. In all three such instances in 1972 however, the bones were chicken vertebrae. In one instance it certainly did not appear to be so, this being a bone said to have been found in a King Prawn Curry, sample M149. It was a vertebral bone but the transverse processes and the metapophysis were of reduced size.

It was therefore sent to the pathologist, Professor Francis Camps, for an opinion . . . and it must be a tribute to the man's memory that he took a real interest in the matter, even though it was later discovered that he was suffering from his terminal illness. That they should have continued to take an interest even after Professor Camps himself had died seems incredible, but his wife Dr. Ann Robinson, and his associate Dr. J. Malcolm Cameron, gathered up the piece of bone from among the outstanding enquiries which Professor Camps had been handling, and had it positively identified as being chicken. We were most grateful to them all.

Among separated articles of this kind there are usually a few which acquire unlikely names. Thus sample M344 which was actually a beetle

was labelled 'FLY', sample M108 which was a piece of suspensory tissue from the meat in a pie was labelled 'WORM', but perhaps the nicest was sample M049, labelled LARVA which a complainant had claimed to have

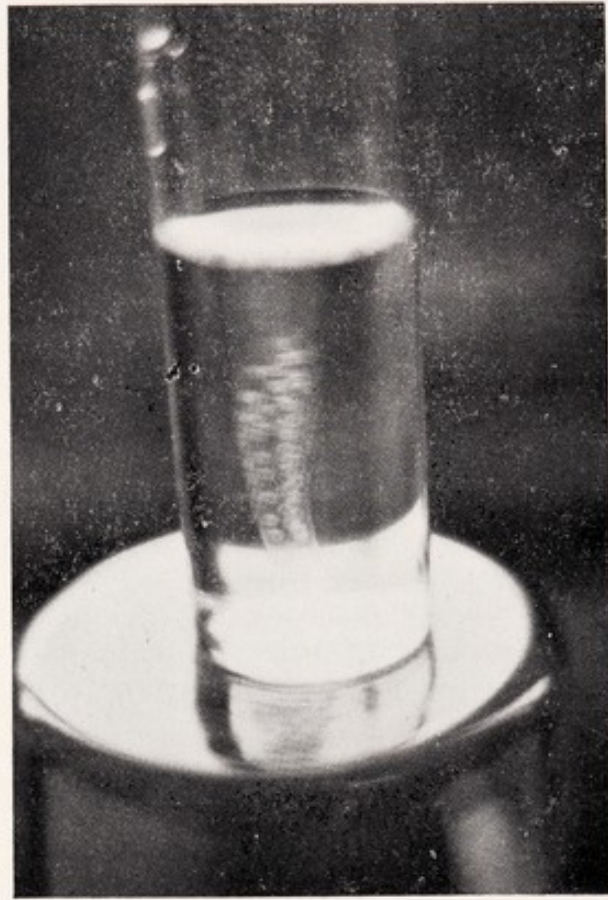


PLATE 47 Snails Eggs

seen crawling about in a milk bottle. It is shown in plate 47 and it consisted of very dead snails eggs. The water snails lay eggs in such a capsule and it adheres very firmly to the object of attachment. This capsule had evidently survived the bottle washers, because it was quite sterile.

Sample M459 was said to be a piece of a tooth found in a meat-pie. At first it was thought it might have been, because it contained 55 per cent of calcium phosphate and 30 per cent of calcium carbonate together with traces of sodium and potassium chlorides, about seven or eight per cent of organic matter and quite a lot of moisture and bacteria. Had it been tooth, however, the owner should have been in pain, because the analysis was appropriate to the inside of teeth. Fortunately the new Principal School Dental Officer, Mr. G. Entwistle, provided the solution. It was salivary calculus, or tartar from the back of somebody's teeth. No doubt it had broken loose when the owner was eating his pie.

From the school meals service there were two complaints. One was a piece of hair and hide—sample number M827, which had been found in a pie. This sample also bore a label which might have appealed to the

schoolchildren. It stated "Hide from School Meals". The laboratory assumed that it was not really intended to be taken as a general instruction. The other sample M461 was a cigarette end submitted with a fragment of raw meat. This was said to have been discovered on a delivery of incoming raw meat at a school kitchen but the laboratory was not very sympathetic. One requirement of kitchen staff is surely that they wash the surfaces of open deliveries of meat?

Finally among the miscellaneous section's contaminated foods was a sample of home made wine, sample M484, thought to have been contaminated by metals dissolved from a metal container and consequently to have impaired flavour, but all that had happened was that air had penetrated the protective layer of carbon dioxide which covers the surface of wine while it is fermenting, and some of the 15 per cent alcohol (by volume) that it contained had been converted to acetic acid.

In one or two instances the laboratory never did quite discover what the reason for an examination was. As we move toward Local Government Reorganisation we notice certain oddities which never seem to have been explained. One is in Section 112 of the Local Government Act where mention is made of public analysts. Formerly, in Section 111 of the Local Government Bill, public analysts were included under subsection 4(d) as statutory officials among others who should be retained by local authorities, whereas in the Local Government Act, Section 112, they are mentioned as a separate category of official altogether. Whether this subtle change has been interpreted in some quarters as meaning that they should do their analyses and thereafter mind their own business is not easy to determine, but 1972 was noticeably affected by its dearth of information about incoming samples. This is not a good thing. Few problems can be solved by chemistry alone. In addition, a public analyst has a right to feel chary of the provisions which are being made in various places for inspectors of different kinds to set up advisory services. Inspectors even now could be thought, under some circumstances, to be providing what an industrial firm would be justified in mistaking for a commercial consultancy service . . . and it could indeed operate against the intention of the Food and Drugs Act if inspectors, particularly those from small authorities, let it be known that they can obtain for a commercial firm a public analyst's analysis of meat products for example, or other items about which there is some controversy. The analysts know that their analytical processes underestimate those protinaceous ingredients which could be mistaken for meat, and it would be worth money to a commercial organisation to know to what extent they could substitute soya products for meat, and still remain reasonably safe. It is to be hoped therefore that second thoughts will be given to official blessing upon advisory service activities. Among sausage and pie analyses in 1972 which the laboratory suspected of having been instituted for the benefit of commercial organisations, laboratory estimates of the soya contents were as high as $7\frac{1}{2}$ per cent, which in times of meat shortage like those recently experienced is a matter to regard with some suspicion. The possibility of less experienced inspectors taking fees from firms in order to have official analyses performed is greater in Districts,

where Food and Drugs inspection is likely to be an occasional half hearted chore than in larger units where sampling duties are extensive enough to occupy the officers' entire attention.

The laboratory itself performed some analyses solely for its own information. Thus M062 was blue sugar bag paper upon which experiments were conducted in connection with a complaint sample, sample S9382, in which paper had been found. Similarly M829 was dishcloth fabric examined in connection with a complaint about fabric in canned peas, sample Chorley 004. M886 consisted of cigarette filter tips examined in connection with a prosecution and M885 was a series of spaghetti products for comparison with an imported item bearing the words "Made with protein-rich pasta". This enabled the laboratory to assert that all canned pasta contains between 10 per cent and 11.5 per cent protein on the dry matter, so that the special claim was not justified. Similar quests for information were involved with sample M930 Steak and Kidney Pie, sample M234 Salt (for iodine content) and several others. Some food samples were accepted under the Miscellaneous heading because they were submitted from sources which do not normally use the laboratory's services. Thus, sample M512 was imported Olive Oil held at a Container Depot until it had been checked, sample M028 was Dirty bread and sample M143 was a specimen of dirty looking but edible potato and fat debris which a member of the public had found in a bag of potato crisps, and for which he insisted upon having a Statutory Certificate in accordance with the term of Section 92(2) of the Food and Drugs Act.

Some items are examined for other purposes. Thus the sausages M266 and M267 were analysed to make sure that they complied with the specification against which they had been purchased on tender. Sample M239 was a pudding mix to be used in the School Meals Service, and whose calorie content is tabulated so that it may easily be compared with values obtained in previous years.

Samples M873, M874, M875 and M876 were samples of Rose Hip Syrup examined before purchases on tender were made, and similarly the department examined aprons, samples M295 to M298 inclusive, and bleach solutions M403 and M404, with the object of helping to select the "Best-Buy".

Sample M290, a sample of Antifreeze was examined on behalf of the Transport Department because of a peculiar claim which was made in the literature. This said "Corrosion inhibition superior to that offered by standard Antifreeze manufactured to BS3150-3152" and it implied that it was for all engines. In fact, it proved to be Antifreeze Type C complying with BS3152 1959 about which the British Standard states that it is intended for engines having cooling systems predominantly of ferrous construction.

Fire extinguisher foams M256, M257 and M258 were examined because one was said to be fermenting. There had certainly been gas generation in the past, and the container was under pressure, but the gas

was hydrogen sulphide and its generation had ceased. Much of it had been absorbed by a precipitation reaction with iron in the product, thus turning the compound black. It was significant that the fault had not occurred at all in opaque containers. The cause appeared to be bacteriological, and the deterioration was greatest in the specimen containing least sulphite preservative.

Sample M557 was interesting inasmuch as it had been the cause of a little Student Agro. University students had taken sides with a cleaning woman who had broken out in a rash after using a spray polish, and County Laboratory was asked, as an independent body, to comment on the nature of the polish. It proved to be a plastic emulsion, containing about eight per cent of poly-acrylate styrene co-polymer. This was thought to be peculiar stuff to be being used as polish, but it proved to be a very common preparation indeed, although the specimen in this instance may have been diluted to about a third or even a quarter the strength normally supplied. Members of the staff sprayed it about and wore it strapped to their arms but absolutely no physiological reactions occurred. It was later learned that the lady had a history of allergic reactions so the suggestion that cleaning staffs were required to endanger their health by use of unsuitable modern methods faded into oblivion.

The laboratory does not like getting involved in litigation which does not concern it, but occasionally it receives samples from the Forensic Science Laboratory. Samples M243, M485 and M553 were all samples of clothing obtained from that source which bore stains suspected of being seminal stains. In the last instance they were thought to be mixed with

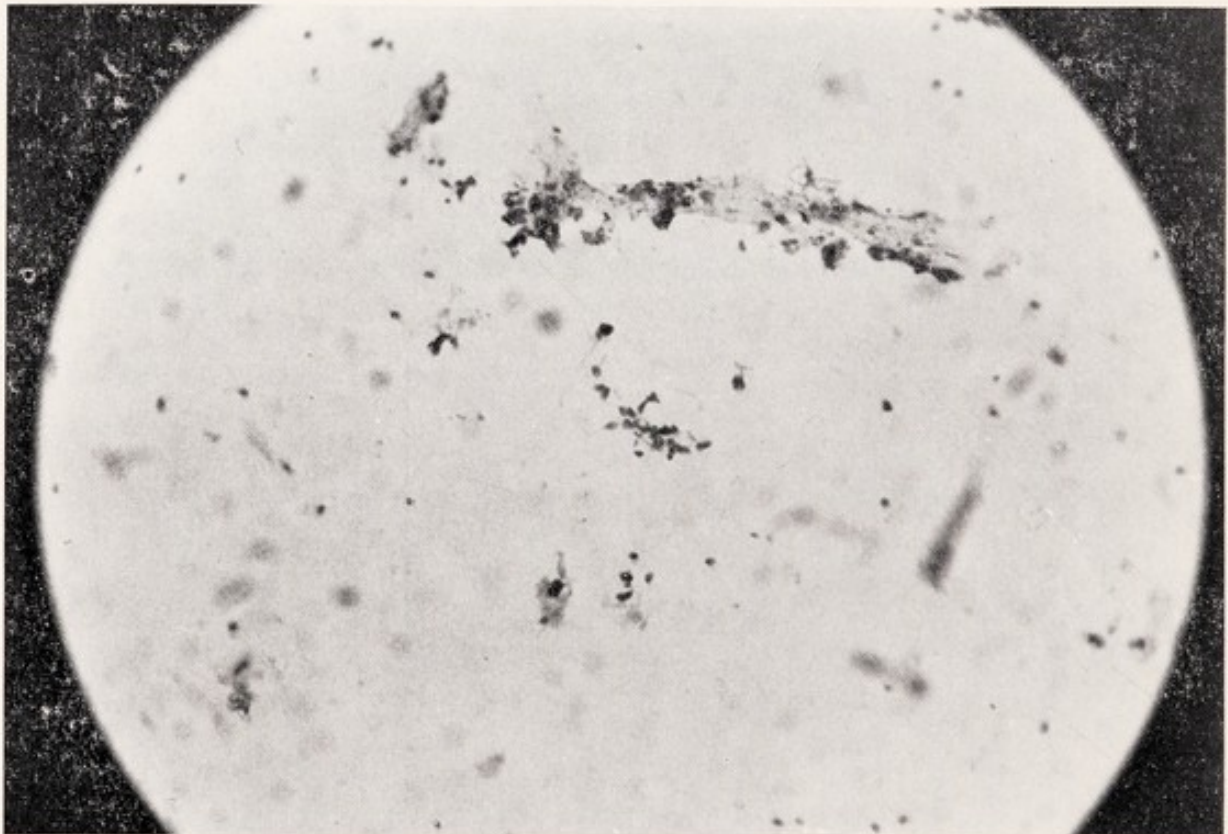


PLATE 48

ointment base. The first had appropriately come to a food laboratory, because it consisted of nothing but maize starch. The second stain consisted of seminal staining, but the laboratory pointed out that, in itself, this proved nothing. An interesting thing about seminal stains is that bacteria quickly devour the tails of spermatozoa, so that stale stains are not easy to recognise. In the illustration (plate 48) for example, there is only one gamete which still possesses a tail. The last sample was stained largely with epithelial cells from skin. The ointments sent for comparison were corticosteroid ointments having lanolin in the vehicle, but no lanolin was present in the stains. At the turn of the year there was a television programme (12 January 1973) which described some new plastic trousers which operating surgeons were to wear. It was stated that the scruffy lads gave off germ laden skin powder, especially from parts not usually exposed, so these special garments had been developed. On that basis, perhaps the laboratory should conclude that sample M553 had belonged to a practising surgeon.

Strangely enough, sample M463 was a pram hood made of nylon which had a pile to its surface, and where the nylon stretched across its wire frame there was white staining which was said to resist removal. On microscopical examination this white material also proved to consist of skin cells.

Early in the year the rate of sampling, which had been reasonably steady in 1971 dropped abruptly to a rate of only 1.6 per thousand of the population. By the end of the year the laboratory was expected to catch up, and was nearly crucifying itself by attempting to handle samples at a rate of 5.2 per thousand of the population. This kind of lack of consideration by those who feed the department, is maddening, and is a potent argument for some sort of control to be maintained on the flow of incoming samples. During the slacker period however, the department turned its attention to a question which had been put to it about bread. Now that Hindu and Muslim members of the community are liable to worry about such things, a question had been raised about the undeclared fats in the making of bread. A series of examinations was instituted in which all the fats examined appeared to be vegetable fats—but it was realised that the small quantities involved could easily be analytically influenced by the natural oil from the wheat used. Thanks to the good offices of Mr. N. M. Regi who had recently joined the staff from a bakery research laboratory, County Laboratory was provided with ten specimens of bakery adjuncts. The cereal component of most of these was wheat or wheat and soya. One consisted entirely of modified fat. In most cases the fatty component accounted for about a quarter of each product, the actual fat generally being palm oil or soya bean oil. They all contained emulsifiers, and the series provided an excellent opportunity to investigate a method of analysis of emulsifiers and stabilisers which had only just been developed by the British Food Manufacturing Industries Research Association, and given limited circulation in their circular number 509. It should be pointed out that the Emulsifiers and Stabilisers in Food Regulations are dated 1962 and practically nothing to solve the problem of analytically distinguishing emulsifiers in food has appeared except *Analyst* 1969 p 481 . . . surely

one of the most powerful arguments in favour of bringing Analysts' departments up to date with adequate staffing. The analytical method investigation on this occasion combined solvent extractions, column chromatography, and thin layer chromatography using several different plate coatings and combinations of different solvents. For each sample two solvent separations, two column fractionations (employing five different solvent combinations) and six thin layer plates had to be run. The ten samples took weeks to investigate, but at least the method does provide a means of classifying the fat soluble emulsifiers used in food.

Sample M408 was another bakery additive submitted separately in late October, but that proved to be little more than a 50/50 mixture of wheat flour and soya. Sample M181 was one of emulsifier Stearyl tartrate.

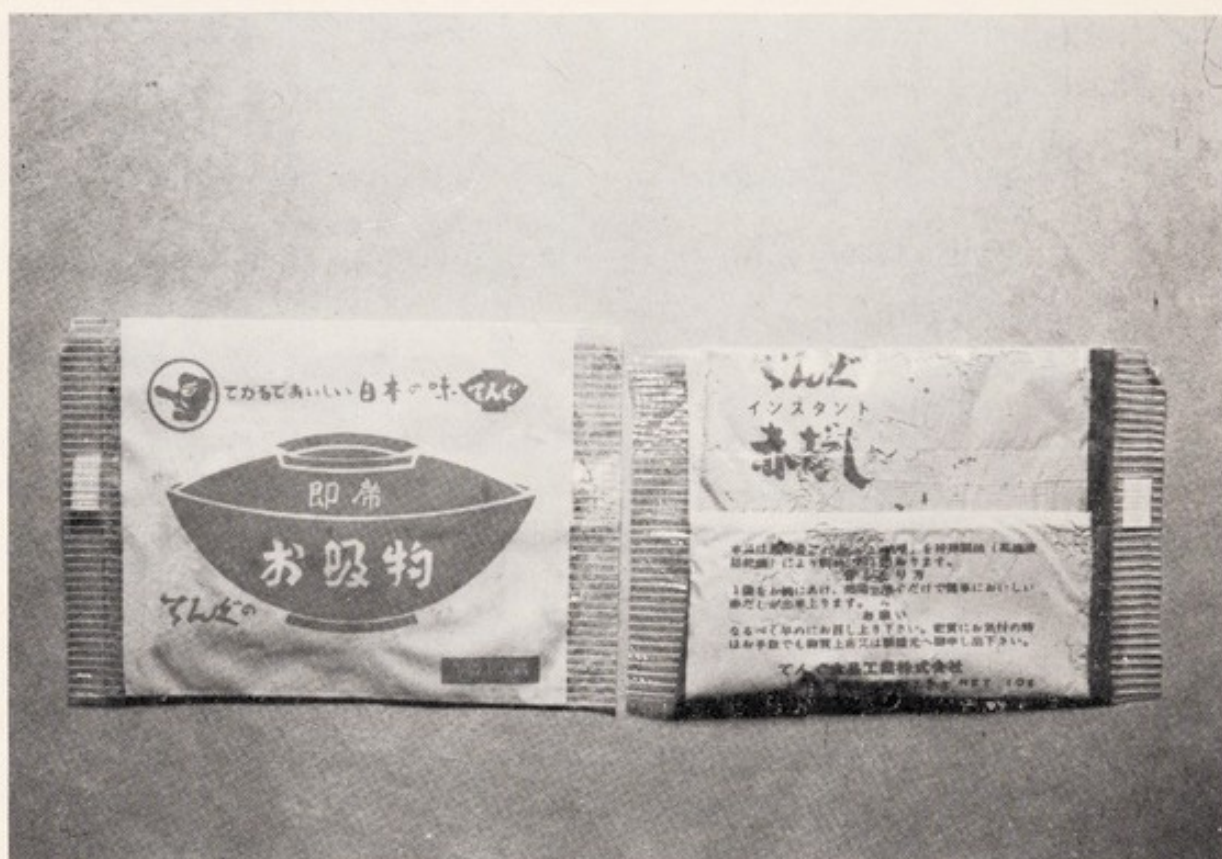


PLATE 49 Jap health food soup powder

Plate 49 illustrates a food item which was said to be a Japanese Health Food. Both packets appeared to be soup powders but sample M596 contained only $4\frac{1}{2}$ grams of food and sample M597 contained $8\frac{1}{2}$ grams of food. They were made up, in the one case, of about 25 per cent bread, 8 per cent of mixed arrowroot and tapioca starches, 2 per cent of dried meat (half of which was fat), 13 per cent of monosodium glutamate and 52 per cent of salt. In the other case the composition was 32 per cent biscuit and bread, 7 per cent fat, 32 per cent soya, 11 per cent monosodium glutamate and 18 per cent salt.

Time was found for further investigatory work on PCB's, the polychlorinated biphenyls which in the Bulletin of Environmental

Contamination and Toxicology 1971 page 468 were stated to be so important in connection with the death of fish. Samples of some of the Monsanto Arochlors were obtained with the help of Mr. G. Telling of Uniliver Research, Sharnbrook, from whom it was learned that the Arochlor numbering e.g. 1248, signifies twelve carbon atoms, and that 48 per cent of the product is chlorine. Specimens of Arochlor 1242, 1248, 1254 and 1260 were provided as sample M856. As a result of having them, and of time made available to investigate them, Mr. M. S. Green was able to publish a note on the subject of PCB determination.

The last group of miscellaneous samples to be considered are not unrelated to contamination, but there is no direct association in this report. The items concerned are cosmetics, which are believed to be largely responsible for difficulties encountered in the use of sewage sludge as a fertiliser for the land. It is the ladies' cosmetics which are said to give sewage sludge such high levels of zinc content that the material is liable to poison plant life. The cosmetics investigated were Eyelid gloss, Eyeshadow, Eyelash adhesive, Hair Conditioner, Hand cream compounds, and Cosmetic oil and cream.

The pearlised eyelid gloss, sample M123, was mainly water, containing glycols and oil in which a material resembling bismuth oxynitrate was suspended. The other materials present were only colour, emulsifier and perfume, and the material seemed quite harmless in use. Sample M151, Eyeshadow, was probably submitted because of a suggestion that some of the Eastern women now in England were using Kohl, or finely divided antimony sulphide for this purpose. The sample, however, was a paste, not very different from sample M123. Samples M259 and M260 were adhesives for attaching false eyelashes to the eyelids, and they were submitted because a child had severely damaged her eyelids with similar material. It proved to be about fifty per cent of an isoprene polymer which had been packed in such tiny tubes that the manufacturer must have felt confident that it could only be used sparingly. It was a little alkaline perhaps, but the only discomfort some of the female staff experienced when they tried it out was the strong adhesion and the difference in elasticity between eyelid and adhesive. It peeled from an adult's eyelid quite easily, and it was felt that the manufacturer could not be held to have been negligent in offering such material for sale. Sample M159, Hair Conditioner, was examined from quite another point of view. It had no statement of quantity upon it, and under the terms of part V of Schedule 7 to the Weights and Measures Act 1963 there is a requirement that toilet preparations for use on human hair whether medicated or not, but excluding soap, should bear a quantity marking. The material contained no soap. It was little more than a five per cent emulsion of lanolin in water.

Sample M284 reflected the concern which was felt in 1972 about the inclusion of Hexachlorophene in soaps, talcum and other cosmetic and toilet preparations. The Scowan Committee on Safety of Medicines was not very concerned about its safety record even though it appreciated that the material was capable of causing brain damage. They merely recommended that its use in baby products should be restricted to items supplied

on prescription. The Pharmaceutical Society advised its members to discourage whole body application of hexachlorophene except on medical advice, but nevertheless most manufacturers chose to withdraw it from use, and substitute trichloro hydroxy diphenyl ether (sold as Ciba-Geigy Irgasan DP 300). Sample M284 was a handcream tube on which adhesive tape had been used to blot out the words "Hexachlorophene 0.5%"; and the strip had lifted. The cream itself however, contained no hexachlorophene.

The last three cosmetics were all concerned with the epidermis. They were being imported from France and all the wording upon them was in the French language. It was clear however, that sample M600 implied that it would grow eyelashes, sample M601 implied an improvement of fingernails and sample M602 suggested that it would improve hair growth. All three preparations seemed to suggest that the efficacious ingredient was horse fat.

The oil for eyelashes was mainly castor oil, but it did contain 25 per cent of horse fat. The cosmetic cream for the nails contained about 30 per cent of oils of which half was horse fat. The hair restorer was an oil in water emulsion containing only 8 per cent of oil, half of which was horse fat. Some attempt was made to see whether the materials had any effect in use, by applying the appropriate material to the nails of one hand, and to the lashes of one eye. A relatively hairless member of staff was even persuaded to rub some of the hair lotion on his shiny top but the results were all absolutely inconclusive.

In any kind of written record one hopes the reader will wish to return for further stimulation on future occasions, so it might be appropriate to end with the observation that the inspector who brought these items started 1973 by submitting to the laboratory a bust development preparation . . . but how it was examined must remain to be told in the Annual Report for 1973.

Eight hundred and twenty-three miscellaneous samples were examined in 1972 and they were submitted from the following sources:— County Medical Officer of Health 185; County Architect 26; Chief Education Officer 10; County Fire Brigade H.Q. 3; County Police 19; County Weights and Measures Department 22; County Transport Department 1; Preston and Chorley Hospital Management Committee 3; Royal Albert Hospital, Lancaster 2; Kirkham Open Prison 2; Blackpool Post Office Engineering Department 1; Department of the Environment 1; Westmorland County Council 2; Lancaster City 7; County Borough of Barrow-in-Furness 10; County Borough of Blackburn 6; County Borough of Burnley 1; County Borough of Preston 9; County Borough of Southport 44; Borough of Accrington 4; Borough of Chorley 1; Borough of Colne 1; Borough of Darwen 9; Borough of Farnworth 4; Borough of Haslingden 2; Borough of Hindley 1; Borough of Kendal 4; Borough of Lytham St. Annes 1; Borough of Morecambe and Heysham 7; Borough of Prestwich 3; Borough of Nelson 1; Urban District of Atherton 1; Urban District of

Denton 1; Urban District of Formby 1; Urban District of Grange 1; Urban District of Huyton-with-Roby 3; Urban District of Kirkby 15; Urban District of Newton-le-Willows 1; Urban District of Oswaldtwistle 1; Urban District of Prescot 1; Urban District of Rainford 3; Urban District of Ulverston 1; Urban District of Whitefield 2; Rural District of Chorley 2; Rural District of Clitheroe 1; Rural District of Lunesdale 1; Rural District of North Lonsdale 1; Rural District of Preston 2; Rural District of Thornton-Cleveleys 3; Rural District of Whiston 10; Onward Building Consortium 1; Public Health Consultant 5; Wyre Dock, Fleetwood 2; Other Public Analyst's Departments 7; Inspect under the Pharmacy Acts 1; Members of the Public 246 (mainly samples submitted under Road Traffic Act 1972). In addition 118 samples were examined for information needed in connection with problems arising out of investigations made on conventional samples.



