

animals, said Sir Walter Bodmer, and many applications of basic research came a long time after the original discovery. Attempts to distinguish between pure and applied research were simplistic since one could never be certain which advances in knowledge would lead to practical applications; also the value of human curiosity should not be discounted.

£80 for a cat and £1000 for a primate

The premise that researchers take no pleasure in hurting animals was not accepted by some antivivisectionists; nor did they concede that, within the constraints of statistical validity, researchers tried to use as few animals as possible. Economics, however, might be more restrictive than ethics, since the cost of a specially bred cat was £80 and that of a primate approached £1000.

As an argument against using animals for human medical research it had been pointed out that had penicillin been tested in certain other species its efficacy would not have been recognised. But Professor Blakemore said that this was an exceptional example, and the assumption of evolutionary continuity was broadly valid. The human genome contained 30 000 functional genes, 60% were

shared with the fruit fly and more than 98% with the higher primates.

The most cogent argument against using animals was that many research procedures cause pain. In Professor Blakemore's own area of research, brain function, there was a circular dilemma—the validity of extrapolating results in animals to man depended on their having feelings, reactions, and emotions qualitatively similar to our own. Computer simulation might be useful for analysis of high level processing, and there were substitutes such as tissue cultures of glial cells and slice preparations, but to approximate to behaviour in life the brain had to be examined in the intact animal. Judicious use of selective anaesthesia was helpful in producing pain relief. Permanent implantation of electrodes and catheters apparently produced little distress, and by contrast to acute experiments the animal could be studied on many occasions. The public, however, was disturbed by "emotive" pictures of wired up animals.

Studies of animal behaviour were also seen by many to be "pointless and cruel", said Professor Patrick Bateson, himself an ethologist. Yet laboratory animals could be the main beneficiaries of behavioural research, since recognition of pain and distress and avoidance of needless suffering depended on knowledge of natural behaviour and response to stressful conditions.

Epidemiology

Report from the PHLS Communicable Disease Surveillance Centre

An increase in outbreaks of acute gastroenteritis associated with the consumption of shellfish, particularly cockles, took place in early 1986. An outbreak of salmonellosis due to contaminated pasteurised milk was reported. Brucellosis, another foodborne disease often associated with milk and dairy products, has now almost disappeared. A further seven cases of the acquired immune deficiency syndrome (AIDS) were reported during April.

Gastroenteritis associated with shellfish

Cockles, mussels, and oysters have been implicated in outbreaks of acute gastroenteritis in recent years. These bivalve molluscan shellfish feed by drawing large volumes of water across their gill structures, which act as a sieve, and they readily become contaminated with human pathogenic organisms when grown in river estuaries polluted by sewage. The association between the consumption of these shellfish and typhoid fever was discovered nearly 100 years ago, but the development of cleansing by depuration eliminated this hazard. Depuration does not always appear to cleanse the shellfish of viruses, however, and the cooking processes used are often not adequate to inactivate them. Outbreaks of viral infection due to the consumption of raw or inadequately cooked shellfish are, therefore, hardly surprising.

Hepatitis A due to eating mussels was first reported in England and Wales in 1978 and subsequently oysters and cockles have been implicated; both home produced and imported shellfish have been responsible. In the winter of 1976 widespread outbreaks of acute gastroenteritis, probably of viral aetiology, associated with the consumption of cockles were reported in southern England. Many further episodes of infection which were shown to be due to viruses of the Norwalk and parvovirus groups occurred after consumption of raw oysters or partially cooked cockles or mussels. Between

December 1985 and April 1986 over 500 cases were reported to the CDSC, resembling the outbreaks of 1976-7 in size and season and in the frequent implication of cockles.

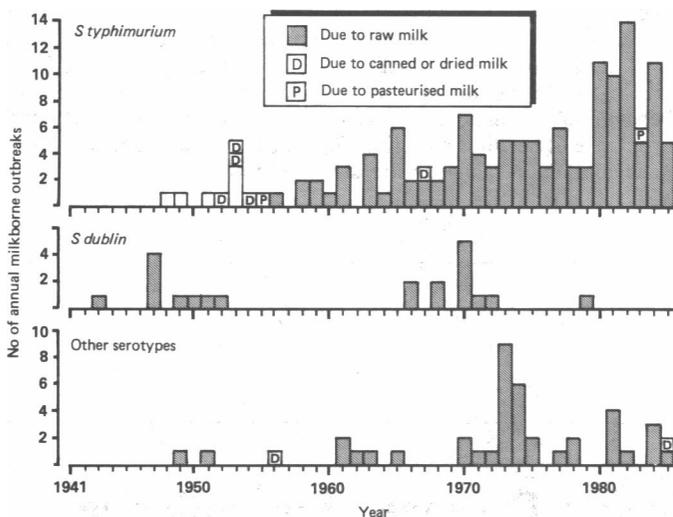
Similar outbreaks of hepatitis A and acute gastroenteritis due to eating shellfish have been reported in North America, Australia, and Europe and appear to be more common than had been previously thought. Hepatitis A may cause a severe and prolonged illness, especially in adults, and viral gastroenteritis, though of shorter duration, is unpleasant and often results in loss of time at work or school. Perhaps the time has now arrived to inform the public widely of these health hazards and emphasise existing advice not to eat raw or inadequately cooked shellfish in the United Kingdom—advice which is even more important in foreign countries in which gastrointestinal infections, hepatitis A, cholera, and other forms of gastroenteritis are common.

Salmonellosis and milk

An unusual national outbreak of salmonellosis mentioned earlier this year (29 March, p 889) was due to dried baby milk contaminated with *Salmonella ealing*. In March and April another unusual outbreak, attributed to pasteurised fresh milk, was reported in Cambridge; 26 cases of infection with *S braenderup* were traced to drinking pasteurised milk. Two carriers in family contacts and five carriers on a farm were discovered. This farm, on which the infection was shown to be present in bulk milk and in dairy equipment, was one of the suppliers of milk to the dairy associated with the outbreak. Post-pasteurisation contamination probably occurred by mixing raw milk with pasteurised milk. The pasteurisation process is being investigated to find out how this accident could have occurred.

Outbreaks of milkborne salmonellosis due to *S typhimurium*

appear to be increasing, but those due to *S dublin* appear to have ceased and those due to other serotypes have declined; infections due to pasteurised or dried milk have been exceptional (figure). In 1941 the PHLS began the systematic surveillance of food poisoning and salmonellosis, and in 1941-85 it recorded 201 milkborne outbreaks (comprising at least 3350 cases), in only two of which pasteurised milk was implicated. One was an outbreak of 17 cases due to *S typhimurium* in 1955, which was thought to be caused by contamination during bottling associated with mouse infestation, and the other of six cases, also due to *S typhimurium*, appeared to be caused by a defective farm pasteurisation plant. Dried milk was implicated in seven of the 201 outbreaks, six of which were small family outbreaks, and one the *S ealing* outbreak already mentioned.



Salmonellosis England and Wales 1951-85.

In three of the family outbreaks the milk was probably contaminated after the tin was opened, and in two the evidence incriminating the milk was poor. In only one outbreak of three cases in 1954 was the infection associated with a freshly opened tin, but no other cases associated with the same product were reported.

These data indicate that the introduction of compulsory pasteurisation of milk will greatly reduce milkborne salmonellosis, but high standards of hygiene and maintenance of equipment in pasteurisation and milk drying plants are essential to eliminate milk as a possible vehicle of infection.

Brucellosis

In 1970 there were nearly 400 laboratory reports of brucella infection in England and Wales, most of them due to *Brucella abortus* acquired in Britain—probably by occupational exposure to infected cattle or by drinking raw milk. Eradication of the infection in cattle began in the early 1970s, and by 1980 laboratory reports of human infection had fallen to 22, a decline which was seen also in data from the Hospital In-patient Enquiry of the Office of Population Censuses and Surveys. In 1985 there were 20 laboratory reports, five of them of *B melitensis* acquired abroad and 15 of *B abortus*, seven of them acquired abroad. Home infections with brucellosis have now declined to single figures each year and are exceeded by infections acquired abroad.

Acquired immune deficiency syndrome

In April 1986 seven cases meeting the case definition of AIDS were reported to the CDSC, the smallest monthly total for nearly a year. Altogether 335 cases have been reported since surveillance

began in 1982 with 170 deaths. The proportion in the main risk group, homosexual or bisexual men, has remained almost constant at about 88% (table).

The fall in the number of cases reported in April is probably due to an increasing time interval between diagnosis and reporting and is unlikely to indicate a decline in the epidemic. Clinicians are invited to report suspected or confirmed cases in confidence to the Director, CDSC, 61 Colindale Avenue, London NW9 5EQ (tel 01 200 6868).

AIDS in Britain up to 30 April 1986

Patient characteristics	No of patients			No of deaths
	Men	Women	Total	
Homosexual or bisexual men	296	0	296	142
Haemophiliacs	14	0	14	12
Recipients of blood	5	1	6	5
Intravenous drug abusers	3	1	4	2
Heterosexual contact	0	2	2	1
Visited Caribbean or United States and at possible risk	3	0	3	1
Associated with Africa:				
Directly	2	5	7	7
Indirectly	0	2	2	0
Other	1	0	1	0
Total	324	11	335	170

On receipt of a report a medical epidemiologist will make further standard inquiries through the clinician. These personal data will be kept in strictest confidence and will be available only to the medical epidemiologist at the CDSC who is responsible for producing from them national surveillance information such as that shown in the table.

Is it true that 50% of people over 60 suffer from hiatus hernia? What is the present treatment?

The rare paraoesophageal (rolling) hiatus hernia is usually seen in the middle aged and elderly. It requires surgical treatment as it is prone to mechanical problems such as strangulation and incarceration. The true incidence of sliding (axial) hiatus is unknown, as the frequency of its demonstration depends on the enthusiasm and techniques of the radiologist or endoscopist. Such hernias may be demonstrable from infancy onwards, but are probably commoner in the elderly, especially if they are overweight. The hernia itself is of little importance and may cause no problems. What matters are associated functional changes leading to symptoms, particularly gastro-oesophageal reflux. Reflux oesophagitis and associated problems such as oesophageal stricture can usually be treated medically but when response to medical treatment is poor, a surgical antireflux operation (sometimes, wrongly, referred to as "hiatus hernia repair") may be necessary.—JOHN BENNETT, consultant physician, Kingston upon Hull.

All about heartburn and hiatus hernia. Published by the British Digestive Foundation, Room D, 7 Chandon Street, London W1A 2LN.

Is there any relation between liver enlargement and a previous cholecystectomy some years back?

Cholecystectomy would not give rise to hepatic enlargement unless the biliary tree was damaged or stones left in the common bile ducts at the time of surgery. Either of these events could lead to secondary biliary cirrhosis. This possibility would best be investigated by ultrasound and direct cholangiography (PTC or ERCP). On the other hand, cirrhosis of the liver is associated with an increased incidence of gall stones¹ and these may become apparent before other symptoms of the cirrhosis. In the absence of symptoms or signs of chronic liver disease liver enlargement is unlikely to be related to the previous cholecystectomy.—ROGER WILLIAMS, consultant physician and director, liver unit, London.

¹ Bouchier IAD. Post-mortem study of the frequency of gallstones in patients with cirrhosis of the liver. *Gut* 1969;10:705-10.