school, supplied with unpasteurized milk from its own herd. One hundred and twenty five girls attended the school, and 92 adults also drank the milk. Half the adults complained of symptoms which could be attributed to brucellosis and three gave a history of a 'recent influenza'. Forty-nine of them had positive titres. In contrast, 22 of the 57 children with positive titres complained of 'influenza', with sore throat and vomiting. Many had lymphadenopathy and splenomegaly which persisted for months.

The third investigation was concerned with the staff of one of the major agricultural research stations in Eire. One hundred and twenty-seven of 150 employees cooperated using Kerr's questionnaire and three sera tests. Eighty-seven, or 68.5%, were negative, and 40 or 31.5% were positive; none of the 40 with positive serology admitted to symptoms.

In 1971, 331 of 1,226 sera initially examined for *Br. abortus* gave positive readings one, two, or three tests (26.9%). Clinically, cases of acute brucellosis still present, usually in adult males and always with a history of raw milk consumption. We have also seen four examples of childhood brucellosis, all presenting with symptoms suggesting osteomyelitis.

There is still need for *Brucella* eradication and for adequate milk pasteurization.

Brucellosis in South-west Scotland

J. LAWSON (*Ruchill Hospital, Glasgow*)

The situation in Scotland with reference to brucellosis is reflected in serological evidence of the disease submitted by the Scottish laboratories to the Communicable Diseases Scotland Unit. The figures are an indication of the prevalence of *abortus* antibodies and are highest in Aberdeenshire and Dumfriesshire; it is not possible to identify clinical forms of the disease; it is suggested that many persons could have acquired antibodies from exposure but have never suffered an illness resembling brucellosis.

The clinical picture of the acute infection is based on 22 patients admitted to Ruchill Hospital over a 10-year period. Fever, headache, sweating, fatigue, and joint pains are predominant. Characteristic drenching sweats and low backache are clinically almost diagnostic. The blood picture is not diagnostic but a low white count with lymphocytosis and a polymorphonuclear leucopenia is a valuable sign. Cases illustrative of acute, subacute, and chronic infection are discussed.

The epidemiological situation in a small residential area which produced 11 of 16 acute cases caused by the consumption of raw milk is described. The results of serological surveys of this area and of other parts of the adjacent countryside are shown; they would appear to confirm that *Brucella abortus* is a low invasive type for man.

Three points are emphasized. (1) There are probably many cases of acute brucellosis not clinically recognizable. (2) All cases must be followed up clinically and serologically in order to establish their clinical category. (3) A diagnosis of chronic brucellosis should never be made without a critical evaluation of history, clinical signs, and serial serology.

Brucellosis in Eastern Turkey

R. OGUTMAN (*Ataturk University, Erzurum, Turkey*)

Brucellosis is still a problem in Turkey. In this limited survey we have tried to find out its incidence in the eastern part of the country. Erzurum is a city located in eastern Turkey: it has a medical school and other technical facilities, and is an active medical centre for a population of about eight million. The main occupation of the population of the region is raising cattle; as well, cattle from other parts of the region are brought to Erzurum to be slaughtered.

In this survey we have selected different groups of people and animals and applied the acridine precipitated serum test for brucellosis agglutination, using *Br. abortus* standard antigen. Agglutination titres of 1/80 or over have been accepted as positive for man, 1/40 and over for cattle, and 1/20 and over for sheep. Selected groups for survey are as follows:

I, Close animal contact with no evidence of clinical brucellosis (385 samples with 1.5% positives); II, no animal contact and no evidence of clinical brucellosis (616 samples with 1.3% positives); III, close contact with meat or meat products with no clinical evidence of brucellosis (283 samples with 18% positives); IV, no contact with animals or meat or meat products with brucellosis but high consumption of milk or milk products (505 samples with 7.4% positives). V, slaughtered cattle (337 samples with 11.7% positives); VI, slaughtered sheep (500 samples with 39.9% positives).

This limited survey shows that asymptomatic brucellosis is present in eastern

Turkey in man and animals. Handlers of meat and meat products have a higher seropositivity than other groups. The seropositive cases are particularly common in males aged 20-29 years. Consumers of milk and milk products also have a high seropositivity without clinical evidence of brucellosis. Cattle and sheep slaughtered in the main Erzurum slaughterhouse also have a high incidence of seropositivity for brucellosis without evidence of active disease.

Progress of the British Eradication Scheme for Brucellosis

W. J. BRINLEY MORGAN (*Central Veterinary Laboratory, Weybridge*)

The successful eradication of an infectious disease is dependent on knowledge of its epidemiology, accurate methods of diagnosis, effective means of vaccination, and/or its treatment.

Mass therapy of bovine brucellosis is neither effective nor economically feasible, and, since 1905 when a departmental committee was set up, the Ministry's main activities in the field of brucellosis have been concerned with advances in diagnostic methods and in vaccination as means of control. Limited trials in the eradication of brucellosis began in 1933 but these had to be abandoned at the outbreak of the Second World War.

In 1942, the use of strain 19 was introduced as a means of controlling the disease; its use in mature animals, however, led to difficulties when using the serum agglutination test in differentiating post-vaccinal titres from those due to infection; as a result, the permissible age when vaccination was allowed was restricted to 4 to 8 months.

The use of a reference serum for standardizing the agglutinating antigens and the development of the complement-fixation test in differentiating postvaccinal from infection titres as well as in detecting the chronic carrier were important landmarks in diagnosis.

The Brucellosis (Accredited Herds) Scheme was introduced in 1967, aimed at identifying and registering brucella-free herds; at this time the use of strain 19 vaccine was restricted to female calves between 91 and 180 days of age. In September 1970, this was replaced by the Brucellosis Incentives Scheme, incentives being used to replace the payment for reactors disclosed at the 'official' test. At this stage too, the Rose Bengal plate test was introduced as the first test to which all

sera are subjected. This test is mediated by the same antibody (IgG1) as that which fixes complement. Compulsory area eradication was started in November 1971 in three main areas (W. Scotland, NW England, SW Wales) and also in the Isle of Wight, and further extension areas have already been announced. This expanding programme, together with the third of herds already participating in the voluntary schemes, presents an encouraging picture for the eventual eradication of the disease.

Total Screening of Blood Donations for Australia (Hepatitis-associated) Antigen and its Antibody

J. WALLACE (*Law Hospital, Carlisle, Lanarkshire*)

During a continuous period of 16½ months all 147 636 donations were tested by immunoelectrophoresis (IEOP) for Australia antigen and its antibody. The number confirmed Au antigen-positive was 104, an incidence of 1 in 1 420. The figures for antibody positive were 82 and 1 in 1 800. Taking only 90 099 first donations, 103 or 1 in 874 were positive for antigen, and 79 or 1 in 1 140 positive for antibody. Thus with rare exceptions donors who were seronegative at the first donation have remained negative at subsequent donations.

The exceptions were four donors, one of whom was found to be antigen positive, and three antibody positive at their second donations. The three antibodies were weak and may have been missed at the original test. These three donors and the recipients of their first donations did not suffer from overt hepatitis. The recipient of the first donation of the donor, who was antigen positive at his second donation, developed Au antigen-positive hepatitis. This donor had a strong Au antigen, but no history of hepatitis. Antigen excess at the time of the original test may have caused a false negative reaction.

To date seven cases of Au-positive hepatitis have been reported among recipients of apparently Au-negative blood. All the donors involved have been reexamined. Two have been found to be Au antigen positive. One was the strong antigen previously mentioned; the other was a weak antigen probably missed at the original test. In the remaining five cases all donors were negative when tested by the techniques of IEOP, immunodiffusion, and complement fixation using a chequer

board titration system. The negative results in these five cases suggest either that a very weak example of Au antigen was present in an original donation, or that there was another portal of entry for the infective agent.

With the exception of one donor who developed acute hepatitis two weeks after donation, and in whom Au antigenaemia was transient, all the positive reactors have remained clinically well and either the antigen or antibody has persisted. The incidence of Au antigenaemia is 1 in 153 in male prisoners, 1 in 803 in non-institutionalized male donors, and 1 in 2019 in female donors. The differences between these groups are statistically significant for Au antigen, but not for Au antibody.

Quality Control in a Chemical Pathology Laboratory

A. JORDAN, J. M. BENTON, R. M. JAMES, AND P. A. MACDONALD (*Royal Infirmary, Sheffield*)

These authors described briefly the Sheffield regional quality control scheme as it affected them and pointed out the need for all laboratories to know the standard deviation of every method in use in the laboratory. This was made very much easier by using the range technique. If the standard deviation be known it is possible to know whether a systematic error is present on a single determination on a specimen in a national quality control scheme. The authors emphasized the importance of all laboratories keeping a record of gross errors.

Investigation of the Role of Pancreatic Trypsin in Ulcerative Colitis

D. M. GOLDBERG (*The Royal Hospital, Sheffield*)

Trypsin has been shown to be an important aetiological factor in the genesis of certain forms of experimental intestinal damage in animals (Bounous, 1967, 1970). Large amounts of active trypsin reach the terminal ileum of man and are subsequently inactivated by trypsin inhibitors of colonic mucosal epithelium (Goldberg, Campbell, and Roy, 1969, 1971). It therefore seemed appropriate to determine whether an abnormality of trypsin or its inhibitor could be detected in patients with ulcerative colitis.

The output of trypsin was determined in 26 patients with ulcerative colitis and eight with polyposis coli, each of whom had

undergone total colectomy and ileostomy. Measurements were made in each subject over periods ranging from three to eight days on a standard diet. Trypsin output was lower in the group with ulcerative colitis, but serial postoperative measurements suggested that this was due to the relatively poorer nutritional status of patients in this group, and no consistent difference was apparent between individuals in both groups whose ileostomy had been established more than one year before the measurements were made.

The activity of trypsin inhibitors was determined in 20 samples of colonic mucosa obtained from patients with ulcerative colitis and 18 samples of histologically normal colonic mucosa from patients with carcinoma of the colon. Higher levels were found in mucosa affected by ulcerative colitis, there being an apparent correlation between inhibitor level and the severity of the lesion as assessed by the extent of ulceration, necrosis, and haemorrhage.

The data do not support the view that a high intraluminal concentration of trypsin, or a reduced cellular protection against its action, are primary or secondary causes of mucosal damage in ulcerative colitis.

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Haematological Population Screening in the Elderly

N. K. SHINTON (*Coventry and Warwickshire Hospital, Coventry*) AND P. C. ELWOOD (*MRC Epidemiology Unit, Cardiff*)

An epidemiological survey has been conducted in subjects of 65 years and over, resident in Coventry, and compared with similar surveys in a mining valley and a seaside town in South Wales. The subjects in the Coventry group were 87 Asian immigrants, 221 'English', and the 'Welsh' group 293 from the valley and 240 from the town. The haematological data included levels of haemoglobin, red cell values, serum vitamin B₁₂, serum, and red cell folate.

Haemoglobin levels showed a wider scatter in the Asian males than in the other groups but otherwise there was no difference found. The overall incidence of anaemia, taking an arbitrary 12 g/100 ml