A Study of the Relationship of Carbohydrate Tolerance in Infection and the Erythrocyte Sedimentation rate with especial reference to Diabetics.

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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

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1. INTRODUCTION.

The effect of infection on carbohydrate tolerance is very variable. Some infections lower the tolerance while others have no effect.

The bulk of evidence from the literature points, in the majority of cases, to a lowering of tolerance both in patients suffering from diabetes mellitus, and in patients not suffering from this disease. A lowered tolerance may occur in what appears to be a very mild infection with no general upset but there may be no lowering in what appears to be a severe degree of infection. The degree of toxaemia, a somewhat vague and wide term, does not apparently affect the degree of variation in response. Further evidence of the variability of response is provided by the fact that some workers have demonstrated a lowered tolerance in cases in which infection was very evident while others have demonstrated a lowered tolerance in cases in which a thorough search had to be made to discover the focus of sepsis. However, as already stated, most authorities are agreed that infection may play a part in lowering carbohydrate tolerance and it is usual when dealing with diabetics to make a thorough search for such foci of infection and this may involve numerous laboratory and radiological procedures in addition to a full clinical examination.

The object of this work was to discover whether any relation could be demonstrated between carbohydrate tolerance in infections and the erythrocyte sedimentation rate (E.S.R.). If such proved to be the case, then an appreciable amount of time and energy would be saved by the routine carrying out of the E.S.R. test rather than the widespread search for foci of infection and this would particularly apply to latent foci.

Put in another way, it was intended to investigate if those infections which did not cause an elevation of the E.S.R. also did not cause an alteration of the carbohydrate tolerance and if those which did cause an elevation of E.S.R. also caused an alteration of carbohydrate tolerance. 6 groups of cases were studied.

Group(1) Diabetics in whom a focus of sepsis was demonstrable. This group comprised 120 patients.

Group (11) Non-diabetics in whom a focus of sepsis was demonstrable. This group also comprised 120 patients.

Group (111) Diabetics in whom no focus of sepsis was demonstrable when they first came under review but who later developed a focus. This group comprised 41 patients.

Group (1V) Non-diabetics in whom no focus of sepsis was demonstrable when they first came under review but who later developed a focus. This group comprised 44 patients.

Group (V) Diabetics in whom no focus of sepsis was demonstrable. T.A.B.C. vaccine was used to produce an artificial fever. This group comprised 10 patients.

Group (V1) Non-diabetics in whom no focus of sepsis was demonstrable. T.A.B.C vaccine was used to produce an artificial fever. This group comprised 10 cases.

While the main object of the work has already been set out, several subsidiary points were studied. These probed the questions as to:-

(1) Whether infections have any permanent damaging effect on carbohydrate tolerance in diabetics and in non-diabetics.

(2) Whether certain organisms are more damaging than others to carbohydrate tolerance.

(3) Whether certain organisms have an effect on a diabetic's tolerance and no effect on that of a non-diabetic and vice versâ.

(4) Whether leucocytosis or pyrexia bear any relationship to carbohydrate tolerance in infection.

The material for study was collected over a 2 year period, March 1947 to January 1949. The patients were drawn from a representative cross-section of the community, both from Glasgow and Ayrshire, the material being studied at Glasgow Royal Infirmary and Ballochmyle Hospital, Mauchline.

All investigations were carried out by the author except for some of the laboratory and radiological examinations. These exceptions have been noted in Section 3 (Procedure of Investigation) and they were subject to strict supervision and check.

2. HISTORICAL REVIEW.

Infections and carbohydrate tolerance in non-diabetics.

The first mention of the subject is by Buhl (1) who noted glycosuria in Asiatic Cholera. Glycosuria was also noted as occurring in diphtheria by Hibberd and Morrissey (2) and in diphtheria, scarlet fever, typhoid, influenza, appendicitis and other suppurative conditions by Cammidge. (3) In none of these works is there any mention of the state of the blood sugar. Hollinger (4) however, in his study of infections noted that glycosuria was accompanied by hyperglycaemia and Hamman and Hirschman (5) demonstrated a lowered glucose tolerance in cases of lobar pneumonia and acute tonsillitis.

The first evidence that different organisms may have different effects was shown by Seitz (6) who studied 16 Streptococcal and 40 Staphylococcal infections; he found a lowering of carbohydrate tolerance in the Staphylococcal group but no impairment in the streptococcal group. That a lowering was due to infection was demonstrated by Pemberton and Foster (7) in a study of 60 cases of arthritis; they found that the removal of foci of infection resulted in the return to normal of a previously lowered carbohydrate tolerance but there was no marked improvement in the arthritis.

Confirmation of a lowered tolerance came from the work by Castellani and Williamore (8) and Harrison (9) who noted glycosuria in malaria; and in carbuncles and gangrene by Cammidge (10) and Higginson. (11) Olmsted and Gay (12) found diminished carbohydrate tolerance in acute infections and Tisdall, Drake and Brown (13) made the same observation in their study of acute infective diarrhoeas of infants. Both groups of workers were using glucose tolerance curves in their investigations. Boulin (14) found an increase in the height of the fasting blood sugar as well as in the height and duration of the glucose tolerance curve in infections. They did not discuss the process of recovery and offered no explanation of their findings.

The first indication that some infections may cause a raising of carbohydrate tolerance came from the work of Hector(15) who demonstrated a lowering of the fasting blood sugar in cases of severe diphtheria. Sick (16) reported a normal fasting blood sugar in febrile conditions but the curve was still abnormally high 4 hrs. after the injection of dextrose and this can be regarded as a lowering of carbohydrate tolerance.

Supporting the majority of workers was the work of Anderson and Schmidt (17) who noted an increased blood sugar in various acute infections e.g., malaria. Evans, Riding and Glynn (18) found a lowering of tolerance in their study of oral sepsis and noted an improvement after dental treatment, but they do not state whether or not there was a return to normal. That the effect was temporary was the opinion of Thomson (19) in his cases of general sepsis. Hollcomb (20) in 2 cases, one of infected teeth and the other of sinusitis, found improvement of a previously lowered tolerance after treatment. Pemberton (21) studying arthritic conditions found that 60% presented a delay in the time at which the glucose leaves the blood. Comparable results were achieved by Holsti (22) Fletcher (23) Warfield (24) Hench (25) and Olmsted and Gay (26). Pringle and Miller (150) noted a normal glucose tolerance curve after removal of foci of infection or on recovery from arthritis. They concluded from a study of 100 cases of arthritis, the arthritis being of various types that:-

(1) A lowered glucose tolerance is present in a large proportion of cases of arthritis and muscular fibrositis and is specially marked in the severe infective type.

(2) The degree of intolerance is roughly proportional to the activity of the arthritic process, using clinical standards to assess the degree of activity.

(3) The tolerance returns to normal on recovery, the rate of return to normal being most marked after the infective foci have been removed.

(4) In cases in which there is a marked glucose intolerance and no infective focus can be found, the prognosis is bad.

Contrary evidence was however, put forward by Schachle and Copeman (27) in a study of rheumatoid arthritis; the initial and final curves were similar even where insulin had been given with symptomatic benefit. Wieland (28) and Geiger (29) noted hyperglycaemia with a rising temperature and a subsequent return to normal as the temperature fell and consequently related the carbohydrate tolerance to the pyrexia. Williams and Dick (30) in an exhaustive study carried out experiments to demonstrate the lowering of carbohydrate tolerance in infections. They noted the most marked decrease in tolerance in those seriously ill and particularly in those with complications. They concluded that a temporary glycosuria occurred in acute infections and contagious diseases as well as in experimental infections. 41% of acute infections had glycosuria if given sufficient glucose, but they do not state the amount of glucose. The decrease in tolerance in their cases could last for weeks or months; the return to normal could be hastened by supplying insulin. Labbé and Boulin (31) noted glycosuria and a lowering of tolerance in febrile patients mostly pneumonic cases. McLean and Sullivan (32) found a decreased tolerance in encephalitis, tuberculosis, meningitis and measles. That the impairment of tolerance may be evanescent was shown by Kohn and Felshin (33) who in 1930, described a decreased sugar tolerance within 2 days after a pneumonic crisis and the curve was normal within another 2 days. Rabinowitch (34) reported on one case in which the tolerance was lowered and he thought that toxaemia was more important than the fever. That there is great variability in response of tolerance to

pyogenic infectionswas the view put forward by Root of Boston (35);Picard (36) noted a fasting hyperglycaemia in patients with carbuncles, furuncles or abscesses. Nissle (37) found a normal fasting blood sugar in staphylococcal and streptococcal infections and this again demonstrates how variable the response can be. Schwartz, Highmann and Malekin (38) Levin and Kahn (39) McGlossan and Holdin (40) Davis and Wills (41) reported a fasting hyperglycaemia in such conditions as acne vulgaris, seborrhoea, psoriasis, sycosis, eczema, dermatitis, rosaceae and urticaria. Later studies however by the following authors did not confirm these findings. Loeb (42) noted it only in dermatitis intertriginosa; Muller (43) Stricher (44) and Matsumoto (45) found no increase. Schanberg and Brown (46) were of the opinion that hyperglycaemia plays only a small part in the production of cutaneous diseases. Fisher (47) studied 600 cases of skin diseases and rarely found hyperglycaemia while Tamber (48) could detect no hyperglycaemia in skin disorders. Mannino (49) and Greenbaum (50) detected no alteration in carbohydrate tolerance and Rost (51) studying the common cutaneous disorders found no pathological curves. However, Ayrs (52) Usher (53) Norducci (54) Fugino (55)+Campbell (56) found hyperglycaemia in skin disorders. To demonstrate what variable results can be obtained Saneford (57) found that the fasting blood sugar was less when the lesion was weeping than in dry lesions. Schmidt, Eastland and Burns (58) studied the effects of pyogenic infections of the cellular connective tissues on carbohydrate tolerance and in addition studied a small group of infective systemic diseases and a number of arthritic and rheumatoid conditions. In the

pyogenic infections 72% showed raised blood sugars but very few glycosuria and they concluded that the glucose renal threshold is raised during infections. A second glucose tolerance curve done immediately on cure of the infection showed normal values. They do not state their criteria of cure.

They noted that an elevated temperature per se does not result in raised blood sugarsand raised blood sugars were also obtained when the temperature was normal. Bacteriological investigations were not made in all cases but it was suggested that streptococci produce the greatest effect. 56·3% of cases of rheumatoid arthritis gave high and prolonged curves. Generally they thought that in the majority of infections of any kind, there was a lowering of carbohydrate tolerance or at least in the rate at which the sugar was removed from the blood stream.

Land and Downie (59) studied 7 patients during infections and in them glycosuria was noted for the first time. They do not state what investigations had been done previous to infection. Glucose tolerance curves during infection showed a slight lowering of tolerance but they returned to normal in a few months. The same authors (60) studied a further 7 cases eg., appendicitis, carbuncle, cholecystitis and found a lowered tolerance which later showed a marked improvement. They do not state whether in these cases there was a return to normal, after treatment.

From this review of the literature we see that in such diverse infections as general septicaemia, skin diseases, cellular tissue suppuration and joint diseases, the bulk of the evidence points to a lowering of

carbohydrate tolerance; this lowering is apparently temporary but it will have been noted that the return to normal may take anything from 2 days to 3 months. We know that the range of normality is wide and what may be normal for one person may constitute a lowered tolerance for another. Thus to speak of a return to normal may not be strictly accurate since there is no evidence in the literature that the patients normal tolerance was known before the onset of infection.

While the evidence already presented shows that in the majority of cases infections cause a lowered tolerance, it also shows that in some there may be no alteration and it may even be raised.

Conditions in which LOWERED CARBOHYDRATE TOLERANCE occurs.

Lawrence (61) sets out a list of conditions in which there appears to be a diminished carbohydrate tolerance.

(1) Toxic and septic conditions, both acute and chronic. He makes the point that a raised E.S.R. may point to an obscure infection.

(2) Endocrine Disorders (a) Thyrot oxicosis (b) Hyperpit uitarism (c) Chromaffin suprarenal tumours.

(3) Old age: the blood sugar curve may show a slight hyperglycaemia and a slow return to normal.

(4) Obesity: tolerance is often lowered and returns to normal on adequate reduction of weight.

(5) Previous starvation or carbohydrate restriction - in these cases ketonuriais often present.

(6) Hepatic eg., hepatitis.

(7) Carcinoma, renal disease and hypertension are sometimes associated with glycosuria.

(8) Nervous system lesions eg., cerebral tumour, cerebral haemorrhage, skull injuries.

(9) Emotional.

INFECTIONS and CARBOHYDRATE TOLERANCE in DIABETICS.

Claude Bernard was probably the first to realise the harmful effect of infection on a diabetic's carbohydrate tolerance. That diabetes mellitus may be preceded by an infection is well-known. Peters (62) reported several cases and Patrick (63) has given details of a case following mumps. Rabinowitch (64) in a statistical study found 9 times as many patients with gall-bladder disease, mainly inflammation, had diabetes as had patients in general. Lichty and Woods (65) noted that diseases of the gall-bladder and bile ducts may later be complicated by "diabetes". They mention 3 cases who recovered from their "diabetes" and gall-bladder disease after operation. None of these authors differentiate between a temporary heightened blood sugar and true diabetes. Graham (66) and Holcomb (67) reported the frequency with which bacterial infection is the cause of the onset of diabetic coma. Joslin (68) noted a history of antecedent infection in 15% of his cases of diabetes and Geyelin (69) relates 8 cases in which diabetes arose within 8 weeks of an infection. White (70) in a study of 100 diabetic children found that only 2% did not have a history of an acute infection preceding the onset of diabetes. Barach (71) in a statistical survey -

found that diabetes was more commonly preceded by chronic tonsillitis, typhoid and pneumonia, than were other chronic diseases. Bech and Pollock (72) state that pathological E.N.T. conditions are frequently found in diabetes but do not compare them with normals. That infections do precede diabetes was also the opinion of Dunn, Votcher and Woodmark (73) and also Foord and Bowen (74) and Warfield (75) who remarked on its occurrence following acute pancreatitis. In a post-mortem study, Stansfield and Warren (76) reported 2 cases of lymphocytic infiltration of the islets of Langerhans. This and the history did suggest an infective origin.

Joslin (77) drew attention to the presence of infection in nearly every case of coma in the pre-insulin era and he also noted that deaths from infection in diabetics increased from 8·5% in the Naunyn era to 26·8% in 1928. Infection, not including tuberculosis or syphilis, was the cause of death in 126 of Warrens (78) 300 fatal cases.

That the influence of infections varies in diabetics as it does in normals, was shown by the work of Lawrence and McCance (79) who described a patient who required an initial increase in insulin dosage followed by a decrease, but not back to original level, when sepsis became progressively worse. Marble, White, and Fernald (80) state that in a well controlled diabetic, resistance to infection approximates to the normal, and there is no alteration in insulin requirements, but that a lessened resistance and consequent increased insulin requirement, cannot be denied in the poorly controlled. McBryde (81) noted the occurrence of relative resistance to insulin in infections. But that this fact was not only due to infections

was shown by its occurrence in uncomplicated diabetes, destructive pancreatic disease, other endocrine disorders, hepatic disease, acidosis, coma, disease of the skin and cardiac decompensation. Boween and Kutzmann(82) studied 84 diabetic women; 34 of these had infections of some part of the renal tract, B. coli predominating. Patients often had no symptoms or at least none that could be differentiated from their diabetic symptoms. They give no control results and no results after removal of the septic foci. They stated that insulin requirements did increase in those with infection but do not give the control figure.

A comprehensive study of the problem of insulin resistance in infections in Diabetics was carried out by Greene and Keohen (84). They studied the problem by:-

(1) Different types of infection or idiopathic fever - 28 cases.

(2) Injections of foreign proteins - 14 cases.

(3) Production of fever by the cabinet method - 4 cases.

(4) Repeated histamine - 2 cases.

(5) Repeated epinephrine - 2 cases.

The urine was rendered sugar free before any of the above were instituted. They pointed out that the insulin requirement in infections was not entirely uniform or predictable. They found that insulin requirements did not develop in all cases of infection whether natural or induced, or after the administration of histamine or epinephrine. The occurrence of increased insulin requirement was not related to sex, age, height, duration of fever or apparent toxaemia. For some reason, the insulin resistence appeared to develop more frequently in mild than in severe cases.

Joslin (85) states that acute infections may cause a flare-up in a diabetic condition with increase in the blood and urinary sugar and cause a tendency to ketosis. He states that the more pronounced the infection, the greater is the effect upon the diabetic condition although a relatively mild infection like the common cold may produce a noticeable effect. In prolonged or chronic infections, insulin requirements may decrease as time goes on. The same author (86) states that infections of the genito-urinary tract are too frequent in women and exemplify the susceptibility of diabetics to infections, particularly to blood-borne infections of the pyogenic type. He suggests that more attention should be paid to the presence of leucocytes in the urinary sediment, particularly in women and each case should be investigated to decide whether any infection is present.

From this review of the literature the fact that infections have in so many cases been incriminated as preceding the onset of diabetes, may lead one to assume that the infection has had a permanent damaging effect on the patient's carbohydrate tolerance resulting in a lowering of this tolerance. One might also assume from the evidence presented here that infections cause a lowered tolerance and ketosis, since they are so often associated with comatose states.

As in non-diabetics, the bulk of the evidence points to a lowering of the carbohydrate tolerance in infections, but in some cases the infection has no such effect. There does not appear, however, to be any evidence of an increased tolerance in some cases as there was with the non-diabetics.

ANIMAL EXPERIMENTS on INFECTION and CARBOHYDRATE TOLERANCE.

By injecting bacteria into the pancreatic duct, Charrin and Garnot (87) produced glycosuria in 3 of 12 dogs. Rosenthal (88) found a severe disturbance of carbohydrate tolerance in experimental diphtheria intoxication and Tisdall, Drake and Brown (89) demonstrated the production, in puppies, of a lowered carbohydrate tolerance when large doses of diphtheria toxin were injected subcutaneously. That infections do have an effect on insulin production was shown by Menten and Manning (90) who noted degenerative changes in the islete of Langerhans in rabbits dying of enteridis-paratyphoid B. infection and by injecting these organisms, the same authors (91) found a marked rise in the blood sugar concentration. Confirmatory work came from Thomas (92) who showed that the same lesions from the same infections can occur in guinea-pigs. As in humans the variability of response in animals to different infections was demonstrated by Jeckwer and Goodall who noted a rapid rise in the blood sugar level of rabbits following the i-v+ injection of some bacteria and no response with other bacteria. Barber (93) observed a hyperglycaemia in experimental cholecystitis in dogs, and Sweeney and Lachey (94) confirmed the production of a lowered carbohydrate tolerance in rabbits by the subcutaneous injection of diphtheria toxin. They noted that as the toxaemia increased, the dextrose tolerance decreased. They made a further study (95) and suggested that toxaemia suppresses endogenous insulin. Sweeney, Barshop and Lobello (96) gave insulin in increasing doses as carbohydrate tolerance decreased. They studied 2 groups (a) Non-toxic rabbits and (b) Toxic rabbits, toxicity being

+ Intra-venous.

produced by diphtheria toxin. All they could conclude from their experiments was that toxaemia interfered in some way with the function of insulin, but not with its site of action. The same authors (97) in a further study found that in contrast to the results in non-toxic rabbits the theoretical dose of insulin necessary to dispose of the increasing quantities of glucose was inadequate in the toxic rabbits. Lawrence and Buckley (98) found that the action of insulin was inhibited by diphtheria toxin in rabbits and at post-mortem they noted signs of over-activity of the thyroid and suprarenals. Strauss (99) studied the problem by the use of streptococcal toxic filtrate i-v on rabbits. A standard carbohydrate diet was used, since it had been shown by Kaguera (100), Greenwold, Gross and Samet (101) and Sweeney (102) that the carbohydrate tolerance is lowered by a low carbohydrate diet. Water was available since lack of water interferes with carbohydrate tolerance as shown by Tisdall, Drake and Brown (89) and Sweeney (102). The results indicated that the ability to remove glucose from the blood was impared by toxaemia. They concluded that the carbohydrate tolerance of rabbits is reduced by streptococcal filtrate and is also reduced by fasting but it is unaffected by streptococcal filtrate + erysipelas antiserum.

Rosenthal and Behrendt (103) noted that the addition of pus in vitro abolished the usual effectiveness of insulin in reducing the blood sugar in experimental animals, but contrary evidence was provided by Delafield (104) who injected dead organisms i-v into rabbits. He found that gram + ve organisms produced no illness and no significant change in the blood sugar. In 8 out of 12 cases, gram - ve organisms raised the blood sugar, however.

Supporting the bulk of the evidence was the work of Schwenther and Noel (105) who noted a decrease in carbohydrate tolerance in rabbits following diphtheria intoxication. Williams and Dick (30) studied the effect of experimentally induced infections in animals on blood sugar curves and the sugar content of 24 hr. specimens of urines. As in their observations on human infections, they noted a temporary glycosuria and a raised blood sugar. Corkill (106) studied the actions of insulin in normal young rabbits and in similar rabbits at an early stage of poisoning with diphtheria toxin. In the non-toxic, insulin did cause a deposition of liver glycogen in young fasting animals; it did not produce its effect in toxaemic animals and there was a consequent increase of the blood sugar. Fetzer (107) carried out experiments on the relation between carbohydrate tolerance and experimental staphylococci infections in rabbits. They showed that animals given dextrose showed an increased resistance to toxins. Wein (108) showed that the production of fever by B. coli has a ketogenic action on rats fed on a fat diet since there is an increased excretion of ketone bodies in the urine immediately after the cessation of a period of fever. During the fever, there was an inhibition of the normal rise of liver glycogen. The same authors (109) showed:-

(1) Fever induced by the subcutaneous injection of B. coli vaccine lowered glucose tolerance in rabbits and rats. When glucose was administered orally, the highest point of the blood sugar curve was higher during fever than when the temperature was normal. The return to the initial level was also slower. After i-v glucose

the highest point was again higher, but there was no delay in the return to the original level.

(2) The normal effect of insulin in producing a deposition of liver glycogen in young rabbits was suppressed during fever.

Wein (110) carried out further experiments on eviscerated cats by injecting B. coli. When glucose was given i-v the effect of insulin in reducing the blood sugar was less in an animal in which fever had been produced and the deposition of muscle glycogen was prevented. Thus the inhibition of insulin action during fever was not restricted to glycogen liver function but was also related to muscle carbohydrate metabolism.

From the evidence presented it will be seen that as much work has been done on the subject of infections and carbohydrate tolerance in animals as in humans and with the same variable results. Thus, infections may cause a lowering of tolerance, may raise, it, or tolerance may remain unaltered, but the bulk of the evidence is in favour of a lowering of tolerance.

ERYTHROCYTE SEDIMENTATION.

H i s t o r i c a l. The first practical application of the sedimentation phenomena as an index of disease was by Fahraeus (133) in 1921. He established the range of normals and the variations found in disease. Davis (134) has outlined the various methods that are used. These are:-

(1) Cutler method.
(2) Rourke - Ernsterne. Both of these require readings at frequent intervals and are generally too time consuming.
(3) Wintrobe - The main advantage of this method is that other blood estimations can be made on the same sample of blood. The anaemia correction factor has to be employed in this method.

(4) Westergren: Davis himself thinks this is the method of choice.

He states:-

(a) A single reading at the end of 1 hour is satisfactory.
(b) It is less sensitive than the Wintrobe method to minor influences.
(c) Experiments have demonstrated a reduced susceptibility to anaemia and it is not worth correcting for anaemia of mild degree.
(d) The operation is simple.

(5) Lenzenheimers: In this the time required for a fall of a given extent is estimated.

In all methods, all authors stress the importance of standardisation of technique. Banuch, Grigg and Guernsey (135) state that:-

(1) A single reading at the end of 1 hour is satisfactory, provided the tube used is long enough and therefore no undue packing of the cells is obtained. They consider a Westergren tube to be satisfactory.

(2) Sodium citrate, heparin, potassium oxalate or Ammonium oxalate + potassium oxalate are all satisfactory anti-coagulants.

(3) Routine correction for anaemia tends to over-correction.

McFarlane and O'Brien (136) state that potassium oxalate should not be used as it causes shrinking and crenation of the red cells by increasing the osmotic pressure of the plasma and thus interferes with rouleaux formation Sodium citrate solution introduces the dilution factor which is more marked in anaemia because of ratio of erythrocytes to plasma volume.

Davis (134) holds that the correction for anaemia factor has by no means gained general acceptance. The following objections to its use have been raised:-

(1) All methods of correction are based on manipulations of ratio of cells to plasma and this may interfere with the underlying mechanism of sedimentation.

(2) The construction of correction charts is not straightforward, and a chart is strictly valid only for a blood sample having the same sedimentation rate and the same initial red cell concentration as that used in the construction of the chart.

(3) Most of the data has been obtained from artificial anaemias and therefore may not be applicable to clinical conditions.

From the evidence of the literature it appears that the most satisfactory method both from the point of view of results and from ease of carrying out, is the Westergren method and no correction for anaemia is necessary. Sodium citrate appears to be as satisfactory an anti-coagulant as any, and the amount by which the sample is diluted remains constant so that comparable results are obtainable.

Cutler (137) agrees that the E.S.R. test is non-specific and serves 2 main purposes, these being as a diagnostic lead and as a measure of intensity of disease.

In all cases in which there was an increased E.S.R. a destructive lesion was noted after full investigations. An increased E.S.R. was found only in destructive disease or in pregnancy. He also agreed that the E.S.R. is a more sensitive index than the T P R charts or blood counts and changes in theE.S.R. parallel the severity of the disease. The test has certain limitations, however, and these are:-

(1) It is not specific.

(2) A normal rate is not conclusive evidence that there is no disease process. He found a normal rate in only 5 of 5,000 cases in which there was clinical evidence of disease.

(3) There is an abnormal rate in pregnancy after the 3rd month.

Nichol (138) states that the preponderance of evidence indicates a direct correlation between the concentration of fibrinogen in the plasma and the E.S.R. Serum globulin also seems to have a definite relationship and an increased plasma cholesterol may cause an increased E.S.R. Whitby and Britton (139) think that increases in plasma albumen, lecithin and nucleoprotein retard the E.S.R.

Nichol (138) gives the normal E.S.R. as 0-15 mm. in 1 hour in males and 0 - 20 in females. Davis (134) gives the following Westergren figures: 3-5 mm. in 1 hour in males and 4-7 in females. Moon and Reimann (135) found that there may not be a return to normal rates until 1 - 2 months after the acute phase of pneumonia. Therefore an increased rate may be of no significance if there has been acute infection recently. Nichol (138) studied the clinical significance of the E.S.R. and gave a resumé of the literature. He states that Wintrobe (140) used the test routinely as a diagnostic aid in the clinic at John's Hopkins Hospital. He noted that increased destruction of tissues caused an increased E.S.R. The test was also used routinely by Agnor (141) at the Joseph H. Platt Hospital.

Whitby and Britton (139) state that the E.S.R. is increased in all conditions where there is tissue breakdown or when foreign proteins enter the blood stream except for localised infections of minor grade such as

chronic sinusitis and apical dental infection. The rate is therefore increased in most infections and toxaemias, after injections of vaccine and other foreign proteins, after operations, fractures, irradiation and in cancer. Polycythaemia and congestive heart failure by reason of an increase of plasma proteins slow up the rate. They found that fever, physically induced, does not affect the rate.

DIABETES MELLITUS.

Davis (134) makes the statement that the effects of diabetes on the E.S.R. are too variable to be of much clinical assistance. He gives no facts or figures in support of this statement.

Kramer (142) studied the E.S.R. in diabetes. He studied it because there is a prevalence of low grade infections in diabetes mellitus and to note whether diabetes per se had any effect on the E.S.R. He made 510 tests on 366 patients. One blood sugar reading was taken at the same time as the E.S.R. He questioned whether the commonly accepted focal infections, employing the E.S.R. as guide, had any effect on the diabetic individual. He concluded that the duration of diabetes had no effect on the E.S.R. nor had the level of blood sugar. As he found so many abnormal rates, he concluded that infection must be the cause. He had difficulty in isolating the offending organism because of the combination of infections in many cases. The following septic foci were studied:-

Teeth: Vast majority with bad teeth had a raised E.S.R.

Tonsils: 66% had a raised E.S.R.

Sinuses: 73·4% had a raised E.S.R.

Chest: 19% had a raised E.S.R.

Gall-bladder: Vast majority had a raised E.S.R.

Renal tract: 50% had a raised E.S.R.

Joints: 84% had a raised E.S.R.

He did not correlate the E.S.R. with glucose tolerance and did not go into the question as to whether treatment of these infections had any effect on the sugar tolerance or the E.S.R. He quoted the work of Wesschink (143) Remer (144) and Goedel and Hubert (145) as being in support of the fact that blood sugar per se had no effect on the E.S.R.

From the evidence, it is obvious that the most common cause of a raised E.S.R. is infection, and this infection may be of any system; but in addition to the points already mentioned, a raised E.S.R. may be found in such brain conditions as malignant glioma, metastatic tumours, tuberculoma, brain abscess and subdural haematomata. It also may occur in any type of malignancy, large peptic ulcers, myocardial infarction, certain types of angina and nephritis. It should be remembered that those diseases which cause a lowering of the E.S.R. may mask a slight elevation of the rate.

The E.S.R. is a valuable simple estimation provided its limitations are recognised.

3. PROCEDURE of INVESTIGATION.

This will be described in groups corresponding to those outlined in Section 1. (Introduction)

In Group (1) These were diabetics who first came under observation as in - or out-patients. Full clinical examination was carried out and the following foci were subjected to more detailed examination for any evidence of

sepsis. These foci were sinuses, teeth, throat, chest, urine and blood. In many cases a source of sepsis had already been elicited from the history and clinical examination. Emphasis during examination was always directed to finding any septic foci, but even in those cases where a focus was evident, further examination was carried out to demonstrate any hidden source. Cervical, urethral and prostatic smears were only performed if the history was suggestive of any such infection.

The following were the methods adopted.

SINUSES: Radiological examination and smears from any evident discharge. In any case of doubt the patient was referred to an E.N.T. surgeon for his opinion.

TEETH: Radiological examination. Edentulous patients were included to exclude any retained roots with attendant infection. If teeth were unhealthy, clinically or radiologically, the patient was referred to a dental surgeon for his opinion. To obtain the causal organism, the pulp of the tooth, after extraction, was swabbed. There was great danger of contamination in this procedure.

THROAT: A throat swab was taken. A direct film was stained by Leishmans method to demonstrate any Vincent's organism and a culture was grown on blood agar and Loeffler's serum. The finding of non-haemolytic streptococci M. catarrhalis and stephylococci was not considered pathogenic, unless their numbers were greatly in excess of normal.

CHEST: Radiological examination. In cases of doubt, a laryngeal swab was taken and cultured on L.J† medium.

SPUTUM: A direct film was stained by Gram's method and cultured on blood agar and L. J. medium.

+Lowenstein-Jensen.

URINE: A catheter specimen was obtained from females and a mid-stream specimen from males. Urine in the bladder is sterile in health and very few bacteria exist in the urethra (146) Thus no contamination should occur. Micro examination was performed and culture carried out on blood agar and McConkey's medium.

BLOOD: The packed cell volume (P.C.V.) and buffy layer (B.L.) were estimated from the same source of blood using Wintrobe's method as described by Whitby and Britton (147). The specific gravity of the blood before spinning and of the plasma, after spinning were estimated by Van Slyke's method as described by Dykes (147) Then, using the attached chart Fig. 1. in the way described on the chart, the haemoglobin (gm./100 cc) haematocrit and plasma proteins were calculated. The buffy layer as an index of the leucocyte count has proved remarkably accurate, particularly within the range up to 20,000 W.B.Cs per c.mm. It gives slightly low readings above 20,000. A differential count was done from the blood before spinning.

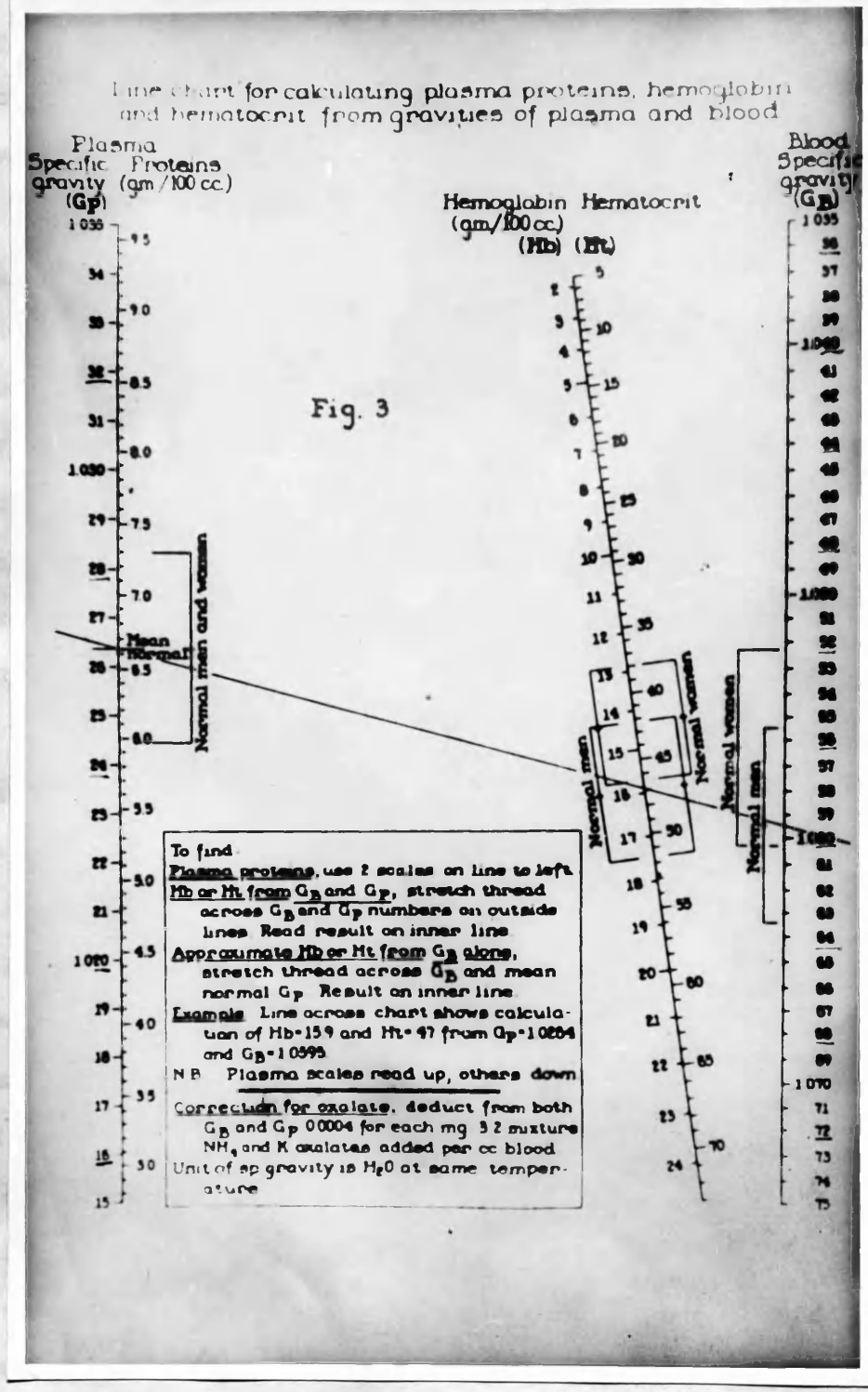
Line chart for calculating plasma proteins, hemoglobin and hematocrit from gravities of plasma and blood
Plasma Specific gravity (Gp)
Proteins (gm/100 cc.)
Hemoglobin (gm/100 cc.) (Hb)
Hematocrit (Ht)
Blood Specific gravity (GB)
Mean Normal
Normal men and women
Normal men
Normal women
To find
Plasma proteins, use 2 scales on line to left.
Hb or Ht from GB and Gp, stretch thread across GB and Gp numbers on outside lines. Read result on inner line
Approximate Hb or Ht from GB alone, stretch thread across GB and mean normal Gp. Result on inner line.
Example Line across chart shows calculation of Hb=15.9 and Ht=47 from Gp=1.0284 and GB=1.0595
N.B. Plasma scales read up, others down
Correction for oxalate, deduct from both GB and Gp 0.0004 for each mg 3:2 mixture NH4 and K oxalates added per cc blood
Unit of sp gravity is H2O at same temperature

Fig. 3

FIG. 1

Blood Wasserman and Kahn reactions: Both W.R. and Kahn reactions were carried out using standard technique (146) If a positive result was obtained and in all cases where the result did not seem to accord with the clinical findings, the test was repeated.

BLOOD CULTURE: A general and streptococcal viridans culture were carried out on all cases. The limitation of the test was that it was only carried out on one occasion when repeat examinations may have grown an organism in some cases where the result is recorded as negative.

E.S.R: The Westergren method using standard technique as outlined by Whitby and Britton (148) was used. Blood was withdrawn at the same time of day, viz., between 10 and 11 a.m. in all cases. The tubes were set up in stands which were kept in the same room and in which the temperature was within the range 65-75°F. During a warm spell of weather, the temperature was higher than in the range and this resulted in an increased E.S.R. These results had to be discarded. Care had to be taken that all tubes were perfectly clean.

The E.S.R. was carried out when the patient first came under observation, then at weekly intervals during the period of infection and at 3 months and in some cases 6 months after the period of infection. The point at which the E.S.R. returned to normal was regarded as the point at which the infection was cured, provided there was no evidence of the septic focus by other means of investigation.

The above measures were carried out routinely on all this group, and the following foci of sepsis were discovered in some cases in addition to those mentioned.

SKIN LESIONS: Staphylococci and diphtheroid bacilli are almost universally found on the human skin and the same bacteria are usually present in the external ear. In taking swabs from skin lesions, aural discharges etc., every effort was made to get a pure growth from the lesion and avoid contamination.

Direct films were stained by Gram's method and cultures made on blood agar and Loeffler's serum if this seemed advisable.

PROSTATIC and URETHRAL LESIONS: Contamination was avoided and direct films were stained by Gram's method and cultures carried out on blood agar.

CERVICAL SWABS: A swab was taken from the cervix or from the area from which the discharge arose, if this could be seen. No smears were taken from the vagina because of the difficulty in interpretation. Examination was by the same methods as those used in prostratic smears.

The radiological examinations were reported on by a radiologist and the bacteriological examinations by a bacteriologist.

PERIOD of OBSERVATION: After a septic focus had been discovered, the patient was put on a diet which was thought to be adequate for his every-day needs. The Lawrence line system of diets was used and these were prescribed in a form which would also be appropriate for any other medical condition which had been found. The patient was kept on the same diet throughout the period of observation. After a preliminary two weeks of diet, the septic focus was confirmed and blood sugars as noted in the following paragraph were carried out.

The limitations attached to diet were concerned with observation of it.

One could be reasonably certain that patients were adhering to their diet while in hospital, but no such guarantee could be given that such was the case when they were out-patients. They were however, attending the Diabetic Clinic regularly and emphasis was always placed on diet observation.

BLOOD SUGARS: 4 blood sugars were estimated in the 24 hours, at 7.30 a.m., 11.30 a.m., 4 p.m., and 9.30 p.m. In practice it proved more satisfactory to start with the 4 p.m. sample and the results have been set out, beginning with it. They were carried out on the same day as the E.S.R. Venous blood was used as often it was not practicable to carry out the estimation at once. The blood was put into bottles containing sodium fluoride and these were put into a refrigerator. The estimations were carried out after the 4 samples had been withdrawn and although this meant that the samples which had been first withdrawn, had been longer in the refrigerator, this was common to all the tests which were accordingly comparable.

Harrison (149) describes the 4 common methods of estimating the blood sugar viz., Folin and Wu., Hagedorn and Jensen, Shaffer-Hartmann and Maclean. The method adopted in this investigation was the Micro Folin and Wu. method. In this the final estimation is colorimetric and as the examiner's matching of colours is not constant, a series of readings has to be taken and the mean accepted. Also different examiners have different ideas of matching colours but most of the estimations were done by the author and this anomaly did not arise. Only one other person did the estimations and these were repeatedly checked, the results agreeing remarkably closely. The main errors were expected to be from the reagents. In all cases the same reagent i.e. from the same bottle, was used for unknown and standard solutions and as far as

possible it was attempted to use the same bottle for each group of blood sugars of the one patient. When new reagents had to be used, these were compared against those previously in use. Checks were also made at intervals of the reagents in use with other similar reagents, to determine that no change was occurring over the period in use. On occasions, reagents had to be discarded. Investigations of this type are very much at the mercy of the chemist making up the reagent and so a constant check as outlined above is necessary. Blood sugars were carried out at intervals during the patients treatment for the eradication of the septic focus. They were repeated at 3 months interval after cure, and in same case at 6 months interval.

INSULIN: Protamine zinc Insulin and Soluble Insulin were alone used. When both had to be used in the same patient, they were given separately.

It was attempted to keep the patient on the same dose of insulin throughout the period of observation. Where this was not possible because of the fear of ketosis or hypoglycaemic attacks, the cases had to be discarded because of the difficulty of analysing results.

TREATMENT of INFECTION: No definite routine was adopted but as far as possible, the same treatment was carried out for similar conditions. The point at which infection was regarded as cured was that point at which the E.S.R. had returned to normal or the focus of sepsis had been eradicated, whichever was the later. At the periods of observation, the original focus of sepsis was checked to see that there had been no recurrence and a general examination was made for any new focus.

In Group 11: These were non-diabetics who first came under observation with an evident septic focus or in whom one was demonstrable. They were subject

to the same search for a septic focus as in Group 1.

In the majority of cases, there was no need to put the patient on to a special diet, apart from seeing that his diet in whatever form, approximated to normal. This was particularly important during febrile illnesses and was not always accomplished. Such cases are noted in the case reports.

BLOOD SUGARS: In these a glucose tolerance curve was carried out using 50 gm. glucose and taking venous blood samples every half hour for 2 hours i.e., 5 specimens in all. The same method of estimation was carried out as in Group 1., and the curves were repeated at intervals during the patient's treatment for the eradication of the septic focus, using the same evidence of cure as in the previous group. They were repeated at 3 months and in some cases at 6 month intervals. The remarks regarding treatment in group 1 are applicable here.

The E.S.R. was carried out weekly in this group as in group 1.

In Group 111: These were diabetics who had been subject to the same investigations as in Group 1. 4 blood sugars in the 24 hours had been done after stabilisation and a septic focus had arisen after this. No septic focus had been noted on initial investigations. From the discovery of a septic focus, the remarks applicable to group 11, apply.

In Group 1V: These were non-diabetics who had been subject to the same investigations as Group 11. No source of sepsis had been demonstrated; a sugar tolerance curve was carried out and at a later date, a septic focus arose. From this point, the remarks applicable to Group 11, apply.

In Group V: These were diabetics who had been subject to the same investigations as in Group 1 and no septic focus had been demonstrated. 4 blood

sugars in the 24 hours had been done after stabilisation, and then T.A.B.C. vaccine was injected. Nelson's method was used; 70 millions on 1st day, 140 millions on 2nd day, 25 millions followed by 30 millions 3 hours later on the 3rd day. Blood sugars were repeated at intervals and E.S.R. were done on the same day as blood sugars.

In Group VI: These were non-diabetics who had been subject to the same investigations as in Group II and no septic focus had been demonstrated. The remarks applicable to Group V, apply from this point, except that a sugar tolerance curve was used instead of the 4 blood samples in 24 hours.

4. RESULTS.

4. RESULTS.

It is appropriate at this point to state the precautions taken in the study of all groups, to state what standards were set and how the results, which are set out in the succeeding pages, were obtained.

As far as it was possible to determine no patient had suffered from any infection, however trivial, for at least 6 months prior to the period of observation. Where this condition was not met, mention of the infection has been made in the appropriate case report, as such an infection may have had an effect on the blood sugar figures. It will be seen that such cases were very few as the majority who gave evidence of a recent infection were not included in the study. It was considered unlikely that an infection would have any effect after 6 months and this was borne out by results.

Only findings relevant to the points under discussion have been included in the case reports and, as far as possible, only positive abnormal findings have been noted.

The degree of infection varied widely in severity but in many cases it was difficult to assess severity of infection and in actual fact this was not attempted although a few observations will be made on this point in Section 5 (Discussion). Most of the diabetics were patients who had had the disease for some considerable time but the degree of severity of the diabetes varied widely within the group. Such severity can be assessed by insulin requirements and the appropriate blood sugar figures.

The temperature figures have only been given in the case reports where there was pyrexia; the duration of pyrexia is the time for the temperature

to return to normal and it does not mean that pyrexia remained at the noted levels during the whole of that time. In no case, however, did the temperature reach normal for more than 24 hours during the period noted as duration of fever.

The same remarks apply to the leucocyte count. In many cases the figure was taken from the buffy layer reading obtained as described on page 25. Only the maximal level has been given and the duration refers to the time for the leucocytosis to disappear. The normal leucocyte count has been regarded as being between 4,000 and 11,000 per c.mm.

In the reports, one organism only has been named as the causal organism in each infection; in several cases more than one organism was isolated but the organism named was in such a majority that it has been regarded as the causal factor. In several cases, no organism has been noted as none was isolated but the diseases in which these occurred are accepted generally, as falling within the "infective group". It may be a valid criticism that such diseases should be included in that organismal group to which they are most closely related or in which the organism is commonly found, but this was not the procedure adopted in this study.

In the diabetic groups, the blood sugar figures have been grouped in fours, the first figure being the 4 p.m. specimen and being followed by the 9.30 p.m., 7.30 a.m. and 11.30 a.m. specimens. An average of these four was taken and is noted under the word "average" in the case reports. It was considered that by taking an average of the blood sugars taken at certain definite times over 24 hours, a better figure for comparison would

be obtained than if the blood sugars, taken at a certain time of day, were used. This procedure would also minimise any experimental error.

In the non-diabetic groups, a sugar tolerance test as outlined on page 30 was employed rather than blood sugars throughout 24 hours. Here we were dealing with 5 sets of figures and again an average of these was taken, as it was considered, as in diabetics, that a better figure for comparison would be obtained. This would take into account 3 factors viz. variability in the fasting level; variability in the height to which the curve went and lastly any delay in removal of glucose from the blood.

In groups 111, 1V, V, and V1, blood sugars were taken before there was any evidence of a septic focus. Blood sugars were taken in groups 1, 11, 111, and 1V at what appeared to be the height of infection as estimated clinically and by the aid of the E.S.R.; and in groups V and V1, at the height of pyrexia and after the pyrexia had produced its maximal effect, if any, on the carbohydrate tolerance. Thus these blood sugars were usually carried out on the 2nd and 3rd days of vaccine injections.

In most cases only one set of blood sugars was done during infection but, in a few cases, two sets were carried out. There was no special reason for this.

Where complete eradication of a septic focus was not possible, note has been made in the appropriate case report.

The next set of blood sugars done was at the end of infection; the criteria of cure adopted being that already mentioned on page 29.. In the case of groups V and V1, it was the point at which the E.S.R. returned to

normal, the temperature in all cases having previously returned to normal. As will be seen from the case reports, further sets of blood sugars were carried out 3 months, and in some cases 6 months, after the sets which have just been mentioned. The investigations carried out before these further blood sugars have already been described (page 29).

The blood sugar figures were used to assess carbohydrate tolerance and it was therefore necessary to determine what was to be regarded as "standard" for each patient. In groups 1 and 11, the standard was the lowest average blood sugar figure obtainable whether it occurred immediately after infection, or at 3 months or 6 months review. The highest average blood sugar figure, occurring either at the height of infection or at what appeared to be the time of cure of a septic focus, was the other figure taken into consideration. Any variation of 10 mgm. or more was considered abnormal. In group III, IV, V, and VI, the "standard" was taken as the figure obtained before infection or pyrexia and the highest figure was at the same time as in groups I and II.

The erythrocyte sedimentation rate was estimated at the same time as the blood sugars. The problem as to a standard was easier here in that only the normal figures had to be decided. Normal rate was regarded as between 0 and 10 mm. in 1 hour both for males and females. It might well be argued that the female rate may be higher normally, particularly during menstruation but it seemed preferable to have one standard for both sexes.

The time taken for the E.S.R. to fall to normal has been indicated in the case reports.

Factors, other than infections, which may have had an influence on the carbohydrate tolerance or sedimentation rate have been noted in the appropriate case report. These factors have already been discussed (pages 9-10 and 21-23). No note has been made where these factors were considered to be exerting a constant influence. Surgery was employed in a number of cases and this may have had an influence on the E.S.R; this factor has not been noted in the appropriate individual cases.

Protamine zinc insulin was given at 7.30 a.m. in all cases in which it was necessary. In the case reports, insulins noted as being given a.m., were injected at 7.30 a.m. and those noted as being given p.m., were injected at 5.30 p.m.

All cases were divided into four age groups. (1) Up to and including 20 years. (2) from 21 to 40 years inclusive. (3) from 41 to 60 years inclusive, and (4) any age over and including 61 years of age.

The matter, other than that explained above, contained in the section of Results is self-explanatory. In most cases, a percentage has been given as well as the actual numbers, but the rule has been observed that no percentage has been given to cases where the total number in any group is less than 10.

GROUP No. 1.

No. of cases.

120 patients were included in this group but as during the period of study 2 of the patients gave evidence of 2 different foci of infection at different times, the group has been regarded as containing 122 cases. These cases are numbers 1 to 120 inclusive.

Table No. 1.

Causal Organisms.

	Number.	Percentage.
Staphylococcus aureus	24	19·7
Staphylococcus albus	20	16·4
Bacillus coli	24	19·7
Haemolytic Streptococcus	22	18
Pneumococcus	7	5·7
Vincent's organism	2	1·6
Streptococcus viridans	1	0·8
Bacillus tuberculosis	1	0·8
Cases in which septic focus demonstrable but no organism isolated.	21	17·2

This last division i.e. cases in which no causal organism was isolated contained such conditions as rheumatoid arthritis, enteritis, various skin conditions, septic teeth, coryza; some cases in which there was a definite pyuria and one case of gastric carcinema in which secondary infection was considered likely.

T A B L E No. 2.

Foci of Sepsis.

	Number.	Percentage.
Skin	41	33·3
Genito-urinary	29	23·3
Throat	21	17·5
Chest	10	8·3
Teeth	9	7·5
Gastro-intestinal	7	5·8
Upper respiratory tract	4	3·3
Blood	1	0·8

The skin group included external infections of the eyes and ears; the majority of cases in the genito-urinary group belonged to the urinary group, only one case related to the genital tract; in the case of subacute bacterial endocarditis the blood has been regarded as the focus of sepsis.

Carbohydrate Tolerance.

Number in which it was lowered = 84 = 69%

" " " " " unaltered = 38 = 31%

One doubtful case (case No. 9) was included in the lowered group . In this case the E.S.R. was at the upper limit of normal and while there was not 10 mgms difference between the first 2 readings, yet the reading at 6 months showed that there may have been a lowered tolerance at the time of infection. The later figure may of course, have been due to a lessening of the diabetic condition irrespective of infection. There were no cases in which the tolerance was raised.

Table 3 gives the proportions of lowered and unaltered tolerances as they occurred with different organisms.

Table 3.

	Staph. aureus.	Staph. albus.	Bac. coli.	Haem. Strep.	Pneum.	Vincent.	Strep. Virid.	B. tuberc.	No. Organism.
Lowered (Numbers)	22	10	18	15	4	2	1	-	12
Unaltered (")	2	10	6	7	3	-	-	1	9
Lowered (Percentage)	91·7	50	75	68	-	-	-	-	58
Unaltered (")	8·3	50	25	32	-	-	-	-	42

Erythrocyte Sedimentation Rate.

Number in which it was raised = 94 = 77%

Number in which it was unaltered = 28 = 23%

Table 4 gives the proportions of raised and unaltered rates as they occurred with different organisms.

T a b l e. 4.

	Staph. aureus.	Staph. albus.	Bac. coli.	Haem. Strep.	Pneum.	Vincent.	Strep. Virid.	B. tuberc	No Organism.
Raised (Number)	23	13	18	17	6	2	1	-	14
Unaltered (")	1	7	6	5	1	-	-	1	7
Raised (Percentage)	96	65	75	78	-	-	-	-	68·6
Unaltered (")	4	35	25	22	-	-	-	-	33·3

Cases with a raised sedimentation rate.

Number in which carbohydrate tolerance was lowered = 84 = 88·3%

" " " " " unaltered = 10 = 11·7%

One doubtful case (Case No. 9) was included in the tolerance lowered group. This question has already been discussed on page

Cases with a normal sedimentation rate.

Number in which carbohydrate tolerance was lowered = Nil.

" " " " " unaltered = 28 = 100%

Table 5 gives the proportions of lowered and unaltered tolerances in those organisms which caused an increased sedimentation rate. Those infections with a normal sedimentation rate all had an unaltered tolerance.

T a b l e. 5.

	Staph. aureus.	Staph. albus.	Bac. coli.	Haem. Strep.	Pneum.	Vincent.	Strep. Virid.	No Organism.
Lowered (Number)	22	10	17	15	4	2	1	12
Unaltered (")	1	3	1	2	2	-	-	2
Lowered (Percentage.)	96	77	94·5	88	-	-	-	83·4
Unaltered (Percentage)	4	23	5·5	12	-	-	-	16·6

AGE INCIDENCE.

Whole Group

	Number.	Percentage.
Age group 0 -- 20 years	14	11
" " 20 -- 40 "	17	14
" " 40 -- 60 "	40	33
" " 60 years and over.	51	42

Group in which carbohydrate tolerance was lowered.

						Number.	Percentage.
Age group	0	--	20	years		8	9·5
" "	20	--	40	"		13	15·5
" "	40	--	60	"		29	34·5
" "	60 years and over					34	40·5

Group in which carbohydrate tolerance was unaltered.

						Number.	Percentage.
Age group	0	--	20	years		6	16·2
" "	20	--	40	"		4	10·5
" "	40	--	60	"		11	28·9
" "	60 years and over					17	44·4

Group in which the sedimentation rate was raised.

						Number.	Percentage.
Age group	0	--	20	years		7	7·5
" "	20	--	40	"		14	15
" "	40	--	60	"		17	18
" "	60 years and over					56	60

Group in which the sedimentation rate was normal.

	Number.	Percentage.
Age group 0 -- 20 years	5	18
" " 20 -- 40 "	3	10·7
" " 40 -- 60 "	9	32
" " 60 years and over	11	39·3

SEX INCIDENCE.

Whole group.	Number.	Percentage.
Males	39	32
Females	83	68

Group in which carbohydrate tolerance was lowered.

Males	32	38·2
Females	52	61·8

Group in which carbohydrate tolerance was unaltered.

Males	14	38·9
Females	24	61·1

Group in which the sedimentation rate was raised.

Males	37	39·4
Females	57	60·6

Group in which the sedimentation rate was normal.

Males	9	32
Females	19	68

Group 2 — Table 6. (Contd).

As was the case with diabetics, into this last group were placed a variety of infections such as skin diseases, acute rheumatism, septic teeth and coryza.

Table. 7.

Foci of sepsis.	Number.	Percentage.
Skins	31	25·5
Genito-Urinary	14	11·5
Throat	30	25
Chest	13	11
Teeth	3	2·5
Gastro-intestinal tract	11	9
Upper respiratory tract	7	6
Joints	9	7
Meninges	3	2·5

Included in the skins group, as was the case with diabetics, were any external infections of the ears and eyes; the acute rheumatism group were put into a group in which joints were regarded as the main focus of sepsis and the meninges were regarded as the focus in cases of tuberculous meningitis.

Carbohydrate Tolerance.

Number in which it was lowered = 75 = 63%

" " " " " unaltered = 46 = 37%

Relation of Pyrexia and Leucocytosis to E.S.R. in cases with a lowered carbohydrate tolerance.

In this group, as has already been noted, there were 84 cases in which the carbohydrate tolerance was lowered and in all of these there was a raised sedimentation rate.

In 30 there was pyrexia of varying degree and in 37 there was a leucocytosis, also of varying degree.

GROUP 11.

Number of cases.

120 patients were included in this group. One patient developed a different infection on 2 separate occasions and this group is regarded as consisting of 121 cases. These cases are numbers 121 to 240 inclusive.

Causal organisms. Table. 6.

	Number.	Percentage.
Staphylococcus aureus	28	23
Staphylococcus albus	9	7·5
Bacillus coli	17	14
Haemolytic streptococcus	27	22
Pneumococcus	7	6
Vincents	3	2·5
Bacillus tuberculosis	7	6
Cases in which septic focus demonstrable but no organism isolated.	23	19

Table 8 gives the proportions of lowered and unaltered tolerances as they occurred with different organisms.

Table. 8.

	Staph. aureus.	Staph. albus.	Bac. coli.	Haem. Strep.	Pneum.	Vincent	B. tuberc.	No organism.
Lowered (Number)	14	3	8	23	5	2	5	13
Unaltered (Number)	14	6	9	4	2	1	2	10
Lowered (Percentage)	50	-	47	85	-	-	-	57
Unaltered (")	50	-	53	15	-	-	-	43

Erythrocyte sedimentation rate.

Number in which it was raised = 100 = 83%

" " " " " normal = 21 = 17%

Table 9 gives the proportions of raised and unaltered rates as they occurred with different organisms.

Table. 9.

	Staph. aureus.	Staph. albus.	Bac. coli.	Haem. strep.	Pneum.	Vincent.	B. tuberc.	No organism.
Raised (Number)	23	4	10	24	7	3	7	19
Unaltered (")	5	5	7	3	-	-	-	4
Raised (Percentage)	82	-	59	89	-	-	-	83
Unaltered (")	18	-	41	11	-	-	-	17

Table 9 (Contd.)

Cases with a raised sedimentation rate.

Number of cases in which carbohydrate tolerance was lowered = 75 = 75%

" " " " " unaltered = 25 = 25%

Cases with a normal sedimentation rate.

Number of cases in which carbohydrate tolerance was lowered = Nil.

" " " " " unaltered = 21 = 100%

Table 10 gives the proportions of lowered and unaltered tolerances in those organisms which caused an inoreased sedimentation rate. Those infections with a normal sedimentation rate all had an unaltered tolerance.

T a b l e. 10.

	Staph. aureus.	Staph. albus.	Bac. coli.	Haem. Strep.	Pneum.	Vincent.	Bac. tuberc.	No organism
Lowered (Number)	12	2	8	23	5	2	5	14
Unaltered (")	11	2	2	1	2	1	2	5
Lowered (Percentage.)	52	-	80	96	-	-	-	76
Unaltered (")	48	-	20	4	-	-	-	24

AGE INCIDENCE.

Whole group.	Number.	Percentage.
Age group 0 - 20 years	33	27·5
" " 20 - 40 "	32	27
" " 40 - 60 "	34	29
60 years and over.	22	16·5

Group in which carbohydrate tolerance was lowered.

	Number.	Percentage.
Age group 0 - 20 years	24	31
" " 20 - 40 "	22	29
" " 40 - 60 "	20	26
" " 60 years and over	11	14

Group in which carbohydrate tolerance was unaltered.

	Number.	Percentage.
Age group 0 - 20 years	9	19·5
" " 20 - 40 "	10	22
" " 40 - 60 "	14	36·5
" " 60 years and over.	10	22

Group in which the sedimentation rate was raised.

	Number.	Percentage.
Age group 0 - 20 years	30	30
" " 20 - 40 "	29	29
" " 40 - 60 "	26	26
" " 60 years and over.	15	15

Age Incidence (Contd.)

Group in which the sedimentation rate was normal.

	Number.	Percentage.
Age group 0 - 20 years	3	14
" " 20 - 40 "	3	14
" " 40 - 60 "	8	38
" " 60 years and over.	7	33

SEX INCIDENCE.

Whole group.	Number.	Percentage.
Males	46	38
Females	75	62
Group in which carbohydrate tolerance was lowered.		
Males	29	39
Females	47	61
Group in which carbohydrate tolerance was unaltered.		
Males	17	39
Females	28	61
Group in which the sedimentation rate was raised.		
Males	39	39
Females	61	61
Group in which the sedimentation rate was normal.		
Males	7	33·3
Females	14	66·6

Relation of pyrexia and leucocytosis to E.S.R. in cases with a lowered carbohydrate tolerance.

In this group, there were 75 cases in which the carbohydrate tolerance was lowered and in all of these there was a raised sedimentation rate. In 49 there was pyrexia and in 46 there was a leucocytosis. Both the pyrexia and the leucocytosis were of varying degree.

G R O U P 111.

All have already been included in group 1 but in that group the cases were considered from the time at which the septic focus was evident. 41 cases were investigated and these were cases numbers:- 1,3,14,21,22,24,27, 29, 30,34,37,38,41,42,44,58,60,61,62,64,69,71,73,74,75,77,78,80,83,85,87,91, 93,96,99, 100, 101,109, 114,115,119.

Carbohydrate Tolerance.

Number in which it was lowered = 30 = 73%

" " " unaltered = 11 = 27%

T a b l e. 11.

Time for Carbohydrate Tolerance to return to pre-infection level.

	Number.	Percentage.
Within 2 weeks	17	56·6
Within 3 months -	9	30
" 6 "	2	6·7
Not returned within 3 months	1	3·3
" " " 6 "	1	3·3

Table 12 gives the return rates as they occurred with different organisms.

T a b l e. 12.

	Staph. aureus	Staph. albus	B. coli	Haem. strep	Vincent.	No organism.
Number returning to pre-infection level in 2 weeks	5	1	3	3	2	3
" " in 3 months	2	1	3	3	-	-
" " in 6 months	-	-	-	1	-	1
" Not returned " " " 3 months	-	-	-	1	-	-
" " " " " " 6 months	-	-	-	1	-	-

Erythrocyte Sedimentation rate.

Number in which it was raised = 31 = 76%

" " " unaltered = 10 = 24%

T a b l e 13.

Time for E.S.R. to return to normal.

	Number.	Percentage.
Within 1 week	8	25·8
" 2 "	22	71
" 3 "	1	3·2

Table 14 gives the return rates as they occurred with different organisms.

T a b l e. 14.

	Staph. aureus	Staph. albus	B. coli	Haem. strep.	Vincent.	No organism
Number returning in 1 week	-	-	1	3	1	3
" " 2 "	7	2	5	7	1	-
" " 3 "	-	-	-	-	-	1

AGE INCIDENCE.

Whole group.	Number.	Percentage.
Age group 0 - 20 years	7	17
" " 20 - 40 "	9	22
" " 40 - 60 "	12	29
" " 60 years and over.	13	32

Carbohydrate Tolerance.

Group returning to original pre-infection level in 2 weeks.

	Number.
Age group 0 - 20 years	1
" " 20 - 40 "	5
" " 40 - 60 "	5
" " 60 years and over	6

Group returning to pre-infection level in 3 months.

	Number.
Age group 0 - 20 years	1
" " 20 - 40 "	1
" " 40 - 60 "	4
" " 60 years and over	3

Group returning to pre-infection level in 6 months.

	Number.
Age group 20 - 40 years	2

Group in which there was no return to pre-infection level.

	Number.
Age group 40 - 60 years	1
" " 60 years and over.	1

Sedimentation Rate.

Group in which return to normal in 1 week.

	Number.
Age Group 20 - 40 years	1
" " 40 - 60 "	3
" " 60 years and over.	4

Group in which return to normal in 2 weeks.

	Number.	Percentage.
Age Group 0 -20 years	2	9
" " 20 -40 "	5	23
" " 40 -60 "	9	40
" " 60 years and over.	6	28

Group in which return to normal in 3 weeks.

	Number.	Percentage.
Age Group 0 - 20 years	1	

SEX INCIDENCE.

Whole Group.	Number.	Percentage.
Males	15	36.6
Females	26	63.4

Carbohydrate Tolerance.

Group returning to pre-infection level in 2 weeks.

	Number.
Males	5
Females	12

Group returning to pre-infection level in 3 months.

	Number.
Males	3
Females	6

Group returning to pre-infection level in 6 months.

	Number.
Males	2

Group in which there was no return.

	Number.
Males	1
Females	1

Sedimentation Rate.

Group in which return to normal in 1 week.

	Number.
Males	2
Females	6

Group in which return to normal in 2 weeks.

	Number.
Males	8
Females	14

Group in which return to normal in 3 weeks.

	Number.
Males	1

GROUP IV.

All have been included in Group 11, but in that group the cases were considered from the time at which the septic focus was evident.

44 cases were investigated and these were cases numbers:- 125, 127, 128, 130, 133, 136, 138, 139, 145, 148, 151, 152, 153, 154, 155, 156, 165, 166, 167, 168, 169, 177, 180, 185, 186, 187, 188, 189, 190, 199, 200, 206, 207, 209, 212, 215, 216, 224, 225, 226, 231, 238, 239, 240.

Carbohydrate Tolerance.

Number of cases in which it was lowered = 30 = 68%

" " " " unaltered = 14 = 32%

Time for carbohydrate tolerance to return to pre-infection level.

Table. 15

	Number.	Percentage.
Within 2 weeks	6	20
" 4 "	4	13·3
" 3 months	19	63·3
" 6 "	1	3·3

Table 16 gives the return rates as they occurred with different organisms.

Table. 16.

	Staph. Aureus	Staph. Albus	B. Coli	Haem. Strept.	Pneum.	Vincent	No. organism
Number returning to original level in 2 weeks:	1	-	1	3	-	-	-
" " " " 4 weeks:	-	-	2	2	-	-	-
Number returning to original level in 3 months:	2	1	1	11	1	1	2
" " " " 6 months:	-	-	-	2	-	-	-

Erythrocyte Sedimentation Rate.

Number in which it was raised = 38 = 86%

" " " " unaltered = 6 = 14%

Table 17.

Time for E.S.R. to return to normal	Number.	Percentage.
Within 1 week	12	32
" 2 "	17	45
" 3 "	7	18
" 4 "	1	2.5
" 5 "	1	2.5

Table 18 gives the return rates as they occurred with different organisms.

Table 18.

	Staph. aureus	Staph. albus	B. coli	Haem. Strept	Pneum.	Vincent	No. organism
Number returning to normal in 1 week:	2	1	2	4	1	1	-
" " " 2 weeks	2	1	2	9	1	1	1
" " " 3 weeks	2	-	2	4	-	-	-
" " " 4 weeks	-	-	-	1	-	-	-
" " " 5 weeks	-	-	-	-	-	-	1

Age incidence.

Whole group	Number	Percentage.
Age group o - 20 years	8	18.5
" " 20 - 40 "	20	46.5
" " 40 - 60 "	9	21
" " 60 years & over	7	14

Carbohydrate tolerance.

Group returning to pre-infection level in 2 weeks.

	Number
age group 0 - 20 years	2
" " 20 - 40 "	1

Group returning to pre-infection level in 2 weeks (contd.)

	Number
age group 40 - 60	2
" " 60 years & over	1

Group returning to pre-infection level in 4 weeks.

	Number
age groups 20 - 40	2
" " 40 - 60	1
" " 60 years & over	1

Group returning to pre-infection level in 3 months.

	Number
Age group 0 - 20 years	5
" " 20 - 40 "	9
" " 40 - 60 "	2
" " 60 years & over	3

Group returning to pre-infection level in 6 months.

	Number
Age group 20 - 40 years	1

Sedimentation rate.

Group in which return to normal in 1 week.

	Number
age group 0 - 20 years	2
" " 20 - 40 "	6
" " 40 - 60 "	3
" " 60 years and over	1

Group in which return to normal in 2 weeks.

	Number
Age group 0 - 20 years	3
" " 20 - 40 "	8

Group in which return to normal in 2 weeks (contd).

	Number
Age group 40 - years	4
" " 60 years and over	2

Group in which return to normal in 3 weeks.

	Number
Age group 0 - 20 years	1
" " 20 - 40 "	4
" " 40 - 60 "	2
" " 60 years and over	1

Group in which return to normal in 4 weeks.

	Number
Age group 20 - 40	1

Group in which return to normal in 5 weeks.

	Number
Age group 0 - 20 years	1

Sex Incidence.

Whole Group	Number	Percentage.
Males	15	34
Females	29	66

Carbohydrate tolerance.

Group returning to pre-infection level in 1 week.

Male	1

Group returning to pre-infection level in 2 weeks.

Females	5

Group returning to pre-infection level in 3 weeks.

Males	1
Females	2

	Number
Group returning to pre-infection level in 4 weeks.	
Male	1
Group returning to pre-infection level in 3 months.	
Males	5
Females	14
Group returning to pre-infection level in 6 months.	
Female	1
Sedimentation Rate	
Group in which return to normal in 1 week.	
Males	6
Females	6
Group in which return to normal in 2 weeks.	
Males	4
Females	13
Group in which return to normal in 3 weeks.	
Males	2
Females	5
Group in which return to normal in 4 weeks.	
Male	1
Group in which return to normal in 5 weeks.	
Male	1

G r o u p V.

10 cases were studied and these are cases number 241 to 250 inclusive.

Carbohydrate Tolerance.

Number in which it was lowered = 10 = 100%

T a b l e 19.

Time to return to pre-pyrexial level.

	Number	Percentage
Within 2 weeks	3	30
" 3 "	1	10
" 3 months	6	60

Erythrocyte Sedimentation Rate.

Number in which it was raised = 10 = 100%

T a b l e 20.

Time to return to normal	Number	Percentage
Within 2 weeks	6	60
" 3 "	3	30
" 4 "	1	10

Age Incidence.

Whole group	Number	Percentage
age group 0 - 20 years	2	20
" " 20 - 40 "	2	20
" " 40 - 60 "	2	20
" " 60 years and over	4	40

Carbohydrate tolerance

Group returning to pre-pyrexial level in 2 weeks.

Group returning to pre-pyrexial level in 2 weeks. (contd)

	Number
Age group 0 - 20 years	1
" " 20 - 40 "	1
" " 60 years and over	1

Group returning to pre-pyrexial level in 3 weeks.

	Number
Age group 60 years and over	1

Group returning to pre-pyrexial level in 3 months.

	Number
Age group 0 - 20 years	1
" " 20 - 40 "	1
" " 40 - 60 "	2
" " 60 years and over	2

Sedimentation rate.

Group in which return to normal in 2 weeks.

	Number
Age group 0 - 20 years	2
" " 20 - 40 "	2
" " 40 - 60 "	1
" " 60 years and over	1

Group in which return to normal in 3 weeks.

	Number
Age group 40 - 60 years	1
" " 60 years and over	2

Group in which return to normal in 4 weeks.

	Number
Age group 60 years and over	1

Sex Incidence.

Whole Group	Number	Percentage
Males	5	50
Females	5	50

Carbohydrate Tolerance

Group returning to pre-pyrexial level in 2 weeks.

	Number
Males	3

Group returning to pre-pyrexial level in 3 weeks.

	Number
Females	1

Group returning to pre-pyrexial level in 3 months.

	Number
Males	2
Females	4

Sedimentation rate.

Group in which return to normal in 2 weeks.

	Number
Males	5
Females	1

Group in which return to normal in 3 weeks.

Females	3

Group in which return to normal in 4 weeks.

Females	1

G r o u p VI.

10 cases were studied and these are cases number 251 to 260 inclusive.

Carbohydrate Tolerance.

Number in which it was lowered = 6 = 60%

T a b l e 21.

Time to return to pre-pyrexial level.

	Number
Within 1 week	1
" 2 "	2
" 3 "	1
" 3 months	2

Erythrocyte Sedimentation Rate.

Number in which it was raised = 10 = 100%

T a b l e 22.

Time to return to normal	Number
Within 1 week	2
" 2 "	5
" 3 "	3

Age Incidence.

Whole group	Number	Percentage
Age group 0 - 20 years	1	10
" " 20 - 40 "	2	20
" " 40 - 60 "	6	60
" " 60 years and over	1	10

Carbohydrate Tolerance.

Group returning to pre-pyrexial level in 1 week.	Number.
Age group 60 years and over	1
Group returning to pre-pyrexial level in 2 weeks.	
Age group 20 - 40 years	1
" " 40 - 60 "	1
Group returning to pre-pyrexial level in 3 weeks.	
Age group 40 - 60 years	1
Group returning to pre-pyrexial level in 3 months.	
Age group 0 - 20 years	1
" " 40 - 60 "	1

Sedimentation rate.

Group in which return to normal in 1 week.	
Age group 20 - 40 years	1
" " 60 years	1
Group in which return to normal in 2 weeks.	
Age group 0 - 20 years	1
" " 20 - 40 "	1
" " 40 - 60 "	3
Group in which return to normal in 3 weeks.	
Age group 40 - 60 years	3

Sex Incidence.

Whole group	Number	Percentage
Males	5	50
Females	5	50

Carbohydrate Tolerance.

	Number
Group returning to pre-pyrexial level in 1 week.	
Female	1
Group returning to pre-pyrexial level in 2 weeks.	
Male	1
Female	1
Group returning to pre-pyrexial level in 3 weeks.	
Female	1
Group returning to pre-pyrexial level in 3 months.	
Males	2

Sedimentation Rate.

Group in which return to normal in 1 week.	
Females	2
Group in which return to normal in 2 weeks.	
Males	3
Females	2
Group in which return to normal in 3 weeks.	
Males	2
Females	1

DIABETICS : GROUP I.

GRAPH to relate E. S. R. to difference in carbohydrate tolerance in individual cases.
Relation only in cases where tolerance lowered.

NON-DIABETICS : GROUP II.

GRAPH to relate E. S. R. to difference in carbohydrate tolerance in individual cases.
Relation only in cases where tolerance lowered.

5. DISCUSSION.

DISCUSSION OF RESULTS.

To avoid unnecessary repetition in this section the findings and conclusions of the subject matter of this thesis have been correlated with previous relevant work only. Where no correlation is attempted there has been no evidence of any previous similar work, at any rate in the author's reading.

As explained in the forework to the Results, it was thought advisable to note those factors which, in addition to infection, may have had an influence on carbohydrate tolerance or E.S.R. only in the relevant case reports rather than bring them into the Discussion. By this procedure, it was hoped that the discussion would not be clouded by too many observations and limitations.

The main object of the study was to determine if any relation existed between carbohydrate tolerance in infections and the erythrocyte sedimentation rate but several other questions were investigated; in addition to the main object the question as to the influence of different organisms on carbohydrate tolerance, the question as to whether certain organisms have more effect on a diabetic's tolerance than on a non-diabetic's and vice-versa; and the relationship of leucocytosis and pyrexia to tolerance in infections, can all be answered by a study of groups I and II.

GROUP I

Table 1. shows the different causal organisms which were isolated; staphylococcus aureus, staphylococcus albus, bacillus coli and haemolytic streptococcus groups form almost 74% of the total in practically equal

proportions. The only other group possessing a moderate percentage is that into which all the infections, in which no organism was demonstrable, have been grouped; the different conditions which were placed in this group have already been stated at the end of Table 1. In diabetics, there is not one organism which flourishes at the expense of the others as the organisms forming the majority are those which are regarded as the commonly occurring pathogenic organisms.

Table 2. demonstrates the different foci of sepsis found in this group; the skin, genito - urinary tract and throat together constitute 74% of the total. No one site is more susceptible to infection than another in this group but this question will be more fully discussed after group II results have been assessed. Kutzmann (82) in his series found renal tract infections in 34 out of 84 unselected cases of female diabetics and bacillus coli was the causal organism in the majority and Joslin (86) state that infections of the genito-urinary tract are too frequent in diabetic women and he thinks that this exemplifies the susceptibility of diabetics to pyogenic blood borne infections.

Table 3. again shows the different organisms but to demonstrate which have an effect on carbohydrate tolerance. All the organisms found, with the exception of the bacillus tuberculosis, have in varying percentages been capable of causing a lowering of tolerance and as the bacillus tuberculosis was only found in one case, no conclusions can be drawn as to its usual effect on tolerance. In over 90% of cases in which the causal organism is the staphylococcus aureus there is a lowering of tolerance and in 75%

in which bacillus coli is the causal organism there is a similar lowering. With haemolytic streptococcus and the group in which no organism was isolated there is a slightly greater percentage causing lowered tolerance than having no effect but with staphylococcus albus the proportion of lowered to unaltered is equal. The other organisms fall into the same category as the bacillus tuberculosis in that there were too few cases from which worthwhile conclusions could be drawn.

The majority of cases have shown a lowered tolerance in infections and this agrees with the evidence presented by various authors on pages 11 to 14. These same authors have also stated that the effect of infection on tolerance is variable and these results are in agreement with this as a number show an unaltered tolerance.

There is a greater percentage in which the sedimentation rate is raised than in which the carbohydrate tolerance is lowered but this particular aspect will be more fully dealt with in a succeeding paragraph. A noteworthy feature is that although a septic focus was discovered in all cases or the case was accepted as an"infection" the E.S.R. was not raised in all but this is in accord with the views of Whitby and Britton (139) that a mild infection may be present without causing a raised E.S.R. and as the cases of diabetes are of varying severity in both groups, i.e. raised and unaltered E.S.R., this agrees with the work of Kramer (142) Wesschink (143) Remer (144) and Goedel and Hubert (145) that blood sugar per se has no effect on the E.S.R.

Table 4. is of the same pattern as Table 3 but in this case E.S.R. has been substituted for carbohydrate tolerance. As with carbohydrate tolerance,

all the organisms, in varying percentages, have raised the sedimentation rate with the exception of the bacillus tuberculosis but the remarks applicable to this organism in its relation to tolerance apply equally well here. As with carbohydrate tolerance, over 90% of cases in which the causal organism was staphylococcus aureus showed a raised E.S.R; almost 80% of cases associated with haemolytic streptococci and 75% of cases associated with bacillus coli showed a raised E.S.R. With all organisms there was a slightly greater percentage showing a raised E.S.R. than showing a lowering of carbohydrate tolerance. The groups involving pneumococcus, Vincent's organism and streptococcus viridans, in addition to bacillus tuberculosis, were too small to form any conclusions.

The next results that have been set down are those concerned with the primary object of this study namely the relation existing between the carbohydrate tolerance in infections and the E.S.R. In almost 90% of cases in which there is a raised E.S.R. there is a lowering of tolerance but in no cases in which there is a normal E.S.R. is there any alteration of tolerance. From this one might assume that if a patient has a normal E.S.R. then carbohydrate tolerance would be unaltered by any evident or latent septic focus. Thus it would appear at first glance that the value of a simple estimation like the E.S.R. had been proved but there are other factors to be considered. It will be shown in group III that the E.S.R. falls to normal before carbohydrate tolerance returns to its original level and so in the intervening period there may be a normal E.S.R. but the carbohydrate tolerance may still be lowered. This aspect will be more fully discussed later.

One might think that as a lowered tolerance is always associated with a raised E.S.R. that there must be some relation between these two findings but other than the relation already stated there does not appear to be anything closer. Even a casual glance at some of the case reports will show that severity of infection as assessed by the E.S.R. does not parallel alteration in carbohydrate tolerance. The blood sugar rise may be 80 mgm./100 cc and the E.S.R. may rise only 10 mm while the blood sugar rise may be 10 mgm./100 cc and the E.S.R. rise may be 80 mm. The great variation has been shown on the graph at the end of Results.

The benefits that would result from the finding that the E.S.R. is always raised in infections which cause a lowering of tolerance are tempered by the knowledge that there is an interval during which the E.S.R. is normal but the carbohydrate tolerance is still moving towards its pre-infection level; and it would not be enough to inquire as to any recent infections as a symptomless infection e.g. case No. 16, may have an influence on both tolerance and E.S.R.

One may accept that if the E.S.R. is raised, in the majority there is a lowered tolerance but no conclusions can be drawn from finding a normal E.S.R.

As a routine test, the E.S.R. would be of limited value only, in assessing lowering or otherwise, of carbohydrate tolerance. The main object of this study has shown that if there is a raised E.S.R., in the majority there is a lowering of carbohydrate tolerance; there is no close relation between E.S.R. and carbohydrate tolerance and the E.S.R. estimation would be only of limited value as a routine measure in diabetics.

Table 5. shows the relation which exists between carbohydrate tolerance in cases in which the E.S.R. is raised, and different organisms. The greatest percentage of lowered tolerance occurs with staphylococcus aureus closely followed by bacillus coli and haemolytic streptococcus. No organism, at any rate in those of sufficient number from which conclusions can be drawn, shows entirely either lowering or unaltered carbohydrate tolerance. All show that they could have either effect although the percentage figure is heavily on the side of lowering of tolerance.

Age Incidence.

The incidence of the whole group follows closely that observed in diabetes generally; 75% are over 40 years of age, the majority of these being over 60 years. In the group in which carbohydrate tolerance is lowered, the age incidence agrees closely with that of the group as a whole; the age incidence of the group in which the E.S.R. is raised shows the majority to be over 60 years but study will reveal that this increase has been made at the expense of the 40 to 60 years age group and as a good proportion of this group are nearer 60 than 40 years of age, there is very little disparity between the age incidence of all these groups.

One can conclude that age has no particular influence on either carbohydrate tolerance in infections or on the E.S.R. and accordingly on any relation between the two.

Lawrence (61) in his table of causes of lowered carbohydrate tolerance lists old age as one; this factor should not enter into any individual

case results as any patient was under observation for two years at the most and there would not be any variation in the age factor during this time. This observation applies to all groups under study.

Sex Incidence.

The incidence of the whole group agrees with that met in diabetes generally.

In the group in which carbohydrate tolerance is lowered and also in the group in which the E.S.R. is raised, the sex incidence agrees fairly closely with that of the whole group.

As with age incidence, sex has no effect on either carbohydrate tolerance in infections or on the E.S.R. and with the relations between these.

When assessing the relationship existing between a leucocytosis or pyrexia and carbohydrate tolerance, there were in the whole group 75 cases in which tolerance was lowered. In 30 of these there was pyrexia and in 37 there was a leucocytosis.

Thus a lowering of tolerance can occur in cases in which there is neither pyrexia nor leucocytosis so neither of these observations would be helpful in assessing those infections which can cause a lowered tolerance. The relation of pyrexia to carbohydrate tolerance in diabetics will be further considered in group V. where pyrexia was produced by T.A.B.C. vaccine.

Group II.

Table 6. shows the different causal organisms which were isolated and as in group I Staphylococcus aureus, staphylococcus albus, bacillus coli and haemolytic streptococcus form the majority although the percentage is not so high in this group, amounting to 67% compared with 74%; staphylococcus albus was found in fewer cases and this mainly accounts for the difference.

As in group I. the only other group which has a moderate percentage is the group from which no organisms were isolated and in numbers it corresponds closely with that found in group I.

From the facts presented, staphylococcus albus is found more often in diabetics than non-diabetics, but the other pathogenic organisms, in those present in sufficient numbers for conclusions to be drawn, show no special affinity for diabetics or non-diabetics.

Table 7. demonstrates the different foci of sepsis; the skin, genito-urinary tract and throat together constitute 62% of the total as compared with 74% in group I. This diminution is not at the expense of any one site. 7% are shown as having "Joints" as their foci of sepsis. These were cases of acute rheumatism and if their foci had been regarded as the throat, there would have been little to chose between group I and II except that group I patients i.e. diabetics, are a little more liable to contract skin and genito-urinary tract infections; this, at any rate as regards genito-urinary tract infections, agrees with the views of Kutzmann (82) and Joslin (86).

Table 8. shows the different organisms which have an effect on carbohydrate tolerance. All the organisms have in varying percentages caused a lowering of tolerance. In this group unlike group I, bacillus tuberculosis has caused a lowering of tolerance in a proportion of cases but in both groups, the numbers are too small to draw any conclusions.

Delafield (104) in animal experiments reported that gram +ve organisms produced no significant change in the blood sugar, unlike the results obtained in humans. Several other workers reported that gram +ve organisms do cause a lowering of tolerance (pages 15 & 16)

The effect of different organisms is strikingly different from those in group I. In this group only haemolytic streptococcus shows a majority in which carbohydrate tolerance is lowered and this is as much as 85% compared with a little over 50% in groups I. With staphylococcus aureus and bacillus coli the proportiom of lowered to unaltered tolerance is about equal compared with 90% with lowered tolerance in group I Staphylococcus aureus and 75% lowered tolerance in group I bacillus coli. With staphylococcus albus, there were twice as many cases with unaltered as with lowered tolerance. In the "no organism" group the proportions are equal as in group I.

From these figures the diabetic is more susceptible to skin and urinary infections than a non-diabetic. Linking up with this is the fact that staphylococcus and bacillus coli affect diabetics' tolerance more.

In non-diabetics, there are more throat infectious and linking up with this, haemolytic streptococcus affect non-diabetics' tolerance more

The fact that haemolytic streptococcus is the organism having most effect numerically on carbohydrate tolerance does not agree with the work of Seitz (6) who stated that staphylococcus causes a lowering of tolerance but streptococcus does not. The results here obtained agree with those of Schmidt, Eastland and Burns who thought that Streptococcus produces the greatest effect in lowering carbohydrate tolerance.

The majority of cases show a lowered tolerance in infections and this agrees with the opinions and evidence of various workers quoted on pages 4 to 9. That the effect of infection is variable is shown by the fact that several have an unaltered tolerance and this accords with the views of the workers cited above, and with the animal experiment results as outlined on pages 15 to 18. In no case however, unlike Hector (15), was a raised tolerance obtained.

As in group I there is a greater number in which the sedimentation rate is raised than in which the carbohydrate tolerance is lowered. Table 9. is of the same pattern as table 8 but E.S.R. has been substituted for carbohydrate tolerance. All organisms, in varying percentages, have raised the E.S.R. In over 80% of cases associated with staphylococcus aureus there is a raised E.S.R, compared with 90% in group I. The haemolytic streptococcus has raised the rate in almost 90% compared with 80% but the bacillus coli has had a lesser effect than in group I. These facts are in keeping with the statements already made regarding the effect of different organisms on diabetics and non-diabetics.

As in group I, the next results are those concerned with the

primary object of the study. In cases with a raised E.S.R. there is a lowered tolerance in 75% compared with 90% in diabetics but, as with diabetics, in no case in which there is a normal E.S.R. is there a lowered tolerance. The remarks which were made in group I concerning the value of this finding are applicable here except that in this group we are dealing with non-diabetics and Group IV instead of Group III shows the interval between E.S.R. fall to normal and carbohydrate return to pre-infection level.

The same conclusions in answer to the primary object of study can be drawn here as in group I.

Table 10. demonstrates the relation between carbohydrate tolerance and raised E.S.R. as it occurs with different organisms. As with group I, the tolerance is lowered in over 80% by both haemolytic streptococcus and bacillus coli but, in contrast to group I, staphylococcus aureus causes a lowering in only 50% compared with 96 %

Age incidence.

The incidence of the whole group differs from group I; there are almost equal numbers in the first three groups and a little more than half the number of any other group in the over 60 years group.

In the group in which carbohydrate tolerance waslowered the age incidence agreed closely with that of the whole group and the same applied to the raised E.S.R. group.

As with diabetics one can conclude that age has had no influence on the results of this group but there may be an influence in comparing group I and II results as the older the patient the more easily is tolerance

lowered and therefore group I cases may have tended to have a more easily altered carbohydrate tolerance.

Sex Incidence.

The incidence in this group is comparable to that in group I. In the group in which carbohydrate tolerance is lowered and in the group in which the E.S.R. is raised, the incidence agrees closely with that of the whole group.

Sex incidence will have had no influence on the results.

As with group I, the value of the relationship of leucocytosis or pyrexia to carbohydrate tolerance in infections was assessed. These are cases in which carbohydrate tolerance is lowered. In 49 of these there is pyrexia and in 46 there is a leucocytosis. A lowered tolerance as in the case of diabetics was present in a considerable number of cases where there was neither pyrexia nor a leucocytosis; neither of these observations would therefore be helpful in this problem of assessing those infections which can cause a lowering of tolerance.

The relation of pyrexia to carbohydrate tolerance will be further considered in group VI where pyrexia was produced by T.A.B.C. vaccine.

In addition to the age incidence which may have had an effect in comparing results, group II patients were generally healthier. There were fewer with myocardial disease and this again may have had an influence on carbohydrate tolerance in group I. These two factors, age and myocardial degeneration, are closely linked.

All the cases in groups III and IV have also been included in groups I and II and so these cases were used to help in the elucidation of the

points under discussion in groups I and II.

The object of the work in groups III and IV was to determine whether infections have any permanent damaging effect on carbohydrate tolerance in diabetics and non-diabetics and if not to note the rate of return to the former level of carbohydrate tolerance and E.S.R.

Group III

Carbohydrate tolerance was lowered in 73% of cases but this aspect of the problem was dealt with in group I.

Table II sets out the times for return of carbohydrate tolerance to the pre-infection levels. In 2 cases together totalling 6.6% of the group there is not a return to the previous level although follow-up investigations had only been done for 3 and 6 months respectively and it is possible that a further fall of blood sugars may have taken place after this time. If no such return to normal had taken place the result would have been in agreement with the views expressed by many workers as detailed on pages 11 to 14. They had noted infection preceding the onset of diabetes in varying percentages of cases or found that infections caused a relative resistance to insulin and the onset of ketosis; one had to assume that such infections had a permanent damaging effect on carbohydrate tolerance at least in those cases in which diabetes arose but results here show that at the most 6% of cases with infection had such an effect and follow-up may not have revealed even this number. Over 50% of cases returned to the previous tolerance within 2 weeks of infection and another 30% returned within 3 months. It cannot be assumed that this 30% did take as long as 3 months as no blood sugars were done between the date on

which infection had cleared and the 3 monthly review. The return to the previous level could have been at any time within this period and all that one is justified in saying is that the tolerance had returned by the end of 3 months, not having reached it at the point at which infection was cured. In 7% of cases, tolerance had not returned by 3 months but did so some time between the 3 and 6 monthly reviews. From the results of this study, the evidence is that in at least 94% there is no permanent effect on carbohydrate tolerance and there may have been no permanent effect in the other 6% if further follow-ups had been undertaken.

Table 12. shows the effect of different organisms on the rate of return of carbohydrate tolerance. In one case in which the return does not take place until between 3 and 6 months and also in the 2 cases in which there is no return to normal, the causal organism is haemolytic streptococcus. 70% of the cases in which staphylococcus aureus is the causal organism show a return of tolerance within 2 weeks and in 75% of cases in which no organism is isolated tolerance had returned within 2 weeks. With other organisms the proportions returning within 2 weeks and within 3 months are approximately equal.

This evidence demonstrates that haemolytic streptococcus has a more prolonged effect on carbohydrate tolerance than other organisms in diabetics and in some the effect may be permanent. Staphylococcus aureus has the most transient effect.

The E.S.R. was raised in 76% of cases and as to be expected from the evidence presented in group I it was raised in all cases in which carbohydrate

tolerance was lowered.

Table 13. shows the time it took for the ESR. to return to normal; this was accomplished in all cases within 3 weeks, almost 97% having returned to normal within 2 weeks. The time taken for the E.S.R. to return to normal is less than that taken by carbohydrate tolerance to return to pre-infection level.

Table 14. shows the effect of different organisms on the time taken for the E.S.R. to return to normal. No particular organism plays any particular part most, as has been stated, returning to normal within 2 weeks and no conclusions other than this can be drawn.

The fairly rapid return does not agree with Moon and Reimann (135) who found that there may not be a return to normal until 1 - 2 months after pneumonia.

Age incidence.

A fair number fall into each age group, the proportion increasing from young to old. In diabetics as a whole, there is a higher proportion in the older groups than is noted here.

From a study of the age incidence as related to the time of return of tolerance, the slower the return of tolerance the greater is the proportion in the older age groups. The older the patient the more likely is he to show a slow return of tolerance and this agrees with the views of Lawrence (61). The cases in which there may have been permanent lowering of carbohydrate tolerance fall into the older age groups. These conclusions are drawn from a study of the results although it will be seen that those cases in which the tolerance returned between 3 and 6 months fell into the 20 - 40 years groups. In those in whom the tolerance returned

within 3 months, the greatest incidence was in the 40-60 age group but most of these were nearer 60 and this group combined with the over 60 years group formed almost 80% In only one case was the patient under 20 years of age and this might suggest that the younger the patient, the less likely is he to have his carbohydrate tolerance impaired by infection. This point will be more fully dealt with in group IV.

In the study of age incidence in sedimentation return rates the age groups 40-60 and over 60 years constitute almost 90% of those in which return to normal was 1 week.

4 of the 7 cases under 20 years showed a raised E.S.R. while only 1 showed a lowering of tolerance and accordingly one cannot blame entirely the mildness of infection for the tolerance results.

From this evidence, the older the patient the more likely is carbohydrate tolerance to be impaired, the more likely it is to take a considerable time to return to normal and tolerance may be permanently impaired.

The older the patient, the quicker will be the return of the E.S.R. to normal.

Sex incidence.

As in diabetics as a whole, femalesare in the majority but from the results in relation to rate of return of both tolerance and E.S.R. no conclusions can be drawn because of the small numbers in the more prolonged groups. It does seem unlikely from the evidence available that sex will affect the results.

Group IV.

The carbohydrate tolerance was lowered in 68% of patients compared with 73% in group III and this, in conjunction with the figures obtained in groups I and II, suggests that diabetics are a little more liable to lowering of tolerance than are non-diabetics. The difference may be greater than is shown as it was a clinical impression, supported by the E.S.R. results, that the infections were of a more severe type in non-diabetics than in diabetics.

Table 15. sets out the times for return of carbohydrate tolerance to pre-infection level. As distinct from group III, there was no case in which there was any suspicion of permanent damaging effect on tolerance and this agrees with the work of Lichty and Woods (65) who noted that their 3 cases of gall-bladder complaints recovered from their "diabetes" after operation. Within 2 weeks only 20% has returned to their pre-infection level compared with 50% in group III and even at 4 weeks only 33% had returned. This initial slower rate of return may well have been due to more severe infections in this group. By 3 months another 63% had returned making 96% in all; the remarks applicable to group III apply equally well here in that return may have taken place any time between 4 weeks and 3 months.

We have seen that diabetics are a little more liable to lowering of tolerance than non-diabetics and now we see that in diabetics there is a slightly greater delay in return of tolerance; 86% returned in 3 months in diabetics and 97% in non-diabetics although the initial rate showed a greater percentage of diabetics and the possibility remains that in

diabetics in a very small proportion of cases, the effect on tolerance may be permanent. That there is usually a return to the previous level of tolerance was the opinion of workers quoted on pages 4 to 9 although some workers state that there was an improvement and other do not discuss the return to normal. The findings in this study are in agreement with those of the majority of workers.

In considering the effect of different organisms on the rate of return of carbohydrate tolerance, as in group III haemolytic streptococcus is responsible for those in which return takes place between 3 and 6 months and 72% of the cases in which this organism is present do not show a return to pre-infection level until after 4 weeks from infection. The results with staphylococcus aureus differ from group III, only 33% having return rates of 2 weeks, compared with 70%, and 60% had rates between 4 weeks and 3 months. 75% of cases associated with bacillus coli have returned to pre-infection level within 4 weeks. Haemolytic streptococcus has a similar effect in diabetics and non-diabetics in having a more prolonged effect than other organisms. But staphylococcus aureus has a more prolonged effect in non-diabetics than in diabetics. In no case was the rate of return as rapid as in Kohn's and Felshin's (33) case. They found a return to normal 2 days after a pneumonic crisis.

The E.S.R. was raised in 86% of cases compared with 76% in group III and this is in support of the clinical impression that the infections in this group are more severe than in group III. Some may consider that the E.S.R. is not a measure of the severity of infection but Cutler (137) thinks that it is a more sensitive index of severity than TPR charts or

blood counts.

Table 17. shows the time it took for the E.S.R. to return to normal. It had returned in all cases within 5 weeks compared with 3 weeks in group III. 95% of this group had returned within 3 weeks but 97% of group III had returned within 2 weeks; this is further evidence that infections in this group were more severe than in group III. As with group III, the return rate of sedimentation was quicker than that of carbohydrate tolerance. Table 18. as was the case with group III, reveals that no particular organisms plays any particular part in the time taken for the E.S.R. to return to normal.

Age incidence.

The major difference from group III is that here there is a much higher proportion in the younger age groups; and unlike group III, there is a considerable number in the under 20 years group who show an altered tolerance.

Again unlike group III, there is a slight increase in the younger groups in those whose tolerance returns to normal in 4 weeks to 3 months but this trend is slight and if the 2 and 4 weeks groups are classed together, the age incidence corresponds closely with that of the whole group. As there is only one case in the 3 to 6 months group no conclusions can be drawn from this.

From these figures age has had no influence on the results in this group.

In this group, the under 20 years group was as liable as any other to a lowering of tolerance and as in group I a lowering of tolerance was noted in the majority of the under 20 years group; it is difficult to place much stress on the finding in group III that a lowering of tolerance

was only found in one case in this age group.

The age incidence in the E.S.R. return times corresponds fairly closely with that of the whole group and age has no effect on this time.

Sex incidence.

Conclusions were difficult due to small numbers in each group but if one classed the carbohydrate tolerance return times into those returning within 4 weeks and those returning within 3 months, the incidence agreed with that of the whole group.

Similarly with the sedimentation rates, there did not appear to be any influence.

In groups I and II the question as to the relationship of carbohydrate tolerance in infections to leucocytosis and pyrexia was discussed. In these groups the pyrexia was that occurring in infections but in groups V and VI the relationship of carbohydrate tolerance to an artificially induced pyrexia was studied.

Group V.

In all cases, carbohydrate tolerance is lowered; this does not agree with the results obtained by Greene and Keohen (84) who found that a lowered tolerance did not occur in all cases of induced pyrexia. Table 19 shows the times the tolerance took to return to pre-pyrexial level; 40% returned within 3 weeks and the remaining 60% have done so within 3 months but as in group III, the return could have taken place at any time between 3 weeks and 3 months. In any event, there are no cases in which there is a permanent lowering of tolerance by pyrexia. In group III 80% of cases in which tolerance was lowered had returned to their pre-infection level within 3 months; therefore there were 20%

of cases differing from the findings resulting from artificially induced pyrexia. Same factor in addition to pyrexia must play a part in lowering tolerance or at any rate in prolonging the return of tolerance to its previous level. Pyrexia undoubtedly plays the major part. The degree of infection, as assessed by the E.S.R. return, is less in the naturally occurring infections than in artificially induced pyrexia and so this aspect cannot be named as the cause of more prolonged lowering of tolerance in group III.

The E.S.R. is raised in all cases and Table 20 shows the times it took to return to normal. All have returned to normal within 4 weeks, 60% having returned within 2 weeks. In group III, 97% had returned to normal within 2 weeks so these facts bear out the statement in the preceding paragraph that the degree and duration of pyrexia are greater in the artificially induced group if one accepts the views of Cutler (137)

Age incidence.

As with diabetics as a whole, the maximal number are in the older age groups but because of the small number of cases, no other conclusions can be drawn.

Sex incidence.

Equal numbers of males and females constitute the group but the remarks made in discussing age incidence are equally applicable here. In diabetics as a whole, there is a slightly greater number of females.

Group VI.

Unlike group V only 60%, compared with 100%, show a lowering of tolerance and this agrees with the findings in groups III and IV that diabetics are more liable to lowering of carbohydrate tolerance than are non-diabetics. In groups V and VI the proportion is 100 to 60 and this is greater than the proportions in groups III and IV. Here we are dealing with relatively the same degree and duration of pyrexia and it will be remembered that the proportions of group III to group IV should have been greater as the degree of infection was less in group III. The findings noted above bear this out. As in group V the major part played by pyrexia is borne out and disagrees with the views of Rabinowitch (34) who thought that toxaemia was more important than fever. The findings in this group disagree with those of Schmidt, Eastland and Burns (58) who stated that an elevated temperature per se does not result in raised blood sugars. In animal experiments Wien (109) has shown that tolerance is lower when pyrexia is present agreeing with the results obtained here.

Table 21. shows the time tolerance took to return to pre-pyrexial level. 64% as compared with 40% in group V returned within 3 weeks; like group V all returned within 3 months. This finding is in keeping with those noted in groups III and IV that a diabetics tolerance takes longer than a non-diabetic's to return to the original level.

In group IV, 97% had returned to pre-infection level within 3 months and therefore only 3% differ from the findings in artificially induced pyrexia. This 3% may well be due to the fact that degree of infection, as assessed by the return rate of E.S.R. was a little more severe in

group IV than group V but these results are almost comparable.

The E.S.R. was raised in all cases and all returned to normal within 3 weeks. Thus the difference in intensity is not so great between groups IV and VI than between groups III and V as in group IV 95% returned to normal within 3 weeks and all by 5 weeks.

Age incidence.

The majority are in the older age groups and if the 2 oldest groups are classed together, there is not much difference from group V.

Sex incidence.

As in group V, equal numbers of males and females constituted the group. Sex and age will have had no influence on the results in groups V and VI.

6. SUMMARY.

In 240 patients, composed of equal numbers of diabetics and non-diabetics, and in whom infection was demonstrable, a study was made to determine causal organisms, foci of sepsis, carbohydrate tolerance, the erythrocyte sedimentation rate and certain relationships of these.

Staphylococcus aureus, staphylococcus albus, bacillus coli and haemolytic streptococcus formed the majority of organisms, staphylococcus albus and bacillus coli being more prevalent in diabetics and haemolytic streptococcus in non-diabetics.

The skin, genito-urinary tract and throat formed the majority of foci, the skin and urinary tract being more prevalent in diabetics and the throat in non-diabetics.

Carbohydrate tolerance was lowered and the E.S.R. was raised in the majority, diabetics being more susceptible to lowering of tolerance than non-diabetics. Staphylococcus aureus and bacillus coli were mainly responsible in diabetics and haemolytic streptococcus in non-diabetics.

In the majority of cases with a raised E.S.R., carbohydrate tolerance was lowered. The E.S.R. returned to its normal level before carbohydrate tolerance and the findings showed that the estimation of the E.S.R. would not alone be sufficient to decide whether or not there was any alteration of carbohydrate tolerance.

A further study of this group showed that no relation existed between the presence of leucocytosis or pyrexia and a lowering of carbohydrate tolerance.

In 41 diabetics and 44 non-diabetics, in whom the carbohydrate tolerance was already known, a study was made to determine whether infections have any

permanent damaging effect on carbohydrate tolerance. In only two cases, both of whom were diabetics, there may have been a permanent damaging effect. In diabetics, the tolerance took longer to return to its pre-infection level than in non-diabetics.

In a further small series of 20 patients, composed of equal numbers of diabetics and non-diabetics, and in whom the carbohydrate tolerance was known, pyrexia was produced artificially. In all diabetics, but not in all non-diabetics, carbohydrate tolerance was lowered. Tolerance took longer to return in diabetics and pyrexia played the major part in the lowering of tolerance.

Sex and age had no effect on any results apart from the fact that in diabetics, the older the patient, the slower was the return of tolerance and the quicker was the fall of the E.S.R. to normal.

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8. CASE REPORTS.

Case No. 1. Housewife. age 65.

Patient had diabetes for 14 years. She had an 8 months history of irritation of the L. shin which was due to varicose veins. She was of pale appearance, a systolic murmur was audible at all areas. B.P. 180/94. E.C.G. showed evidence of myocardial disease with intraventricular block. Renal function was good. Fundi showed silver wiring of the arteries and cardiac appearances radiologically were those of the hypertensive type. She developed dysuria and urinary frequency of moderate severity.

Urine: Pyuria. B. coli.

Treatment: Sulphatriad gm. 1. 8 hourly for 10 days.

Pot. Citrate and Sod. Bicarb. grxxx aa T.I.D. for 10 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	100 120 115 110	111	4	40 P.Z.1.
On Infection:	130 125 110 115	120	20	40 P.Z.1.
After Infection:	135 130 115 125	126	6	40 P.Z.1.
After 3 months:	110 115 100 110	109	7	40 P.Z.1.
After 6 months:	100 105 90 100	99	4	40 P.Z.1.

Time for E.S.R. to return to normal = 2 weeks.

Case No. 2. Male. age 61. Cashier.

Patient had diabetes for 4 years. Admitted with complaint of loss of weight for 4 months, dysphagia for 10 days and vomiting for 2 days, the vomitus being of a reddish brown material. He had suffered from asthma since childhood. He was emaciated and in a pre-comatose condition. Sputum was blood stained and gastric lavage showed contents of a brownish colour. He was initially treated as a pre-diabetic coma, but by 3 months he was on his

Case No. 2. (Contd.)

usual diet and insulin , and the following findings are after this point.

Temperature was 100-101° falling slowing to normal. Normal by time of 2nd blood sugar readings. Normal in 2 weeks.

W.B.C. - 16,000 per c.mm.

Chest: Inflamatory zone at R. apex. Resolution occurred.

Sputum: Staphylococcus aureus.

Treatment: Penicillin 100,000 units 6 - hourly for 17 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	284 296 311 294	296	22	44 P.Z.I.
After Infection:	252 282 229 286	262	4	44 P.Z.I.
After 3 months:	218 244 184 214	215	4	44 P.Z.I.

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 3. Housewife: age 33.

1 years history of symptoms suggestive of diabetes mellitus. Developed acute tonsillitis of moderate severity.

Temperature: Varied between 99 and 100° for 4 days.

W.B.C. = 16,000 per c.mm.

Throat Swab: Haemolytic streptococci.

Treatment: Penicillin 100,000 units 6 - hourly for 11 days.

Penicillin lozenges S.O.S. during above period.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	192 204 200 187	196	4	20 P.Z.I.
On Infection:	190 200 214 176	195	7	20 P.Z.I.
On Cure:	205 202 226 186	205	4	20 P.Z.I.
After 3 months	190 212 210 184	199	7	20 P.Z.I.

Case No. 3. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin
After 6 months:	186 204 200 192	196	8	20 P.Z.I.

Case No. 4. Housewife. age 42.

Diabetes mellitus for 13 years. 6 months history of oedema of ankles. frontal headaches and listlessness. Cardiac sounds soft. B.P. 140/90 E.C.G. showed L. heart strain, renal function was poor, albuminuria was present. Fundi showed numerous small haemorrhages with an exudate on the left. Throat: Haemolytic streptococci, slight sore throat, but no general toxaemia. Treatment: Penicillin lozenges 1 - 2 hourly for 3 days.

	Blood Sugars.	Average.	E.S.R.	Insulin
on throat Infection:	171 159 187 171	172	30	Nil.
On Cure:	134 153 130 128	136	6	Nil.
After 3 months:	118 132 126 130	127	9	Nil.

Time for E.S.R. to fall to normal = 1 week.

Cardiac condition showed a slight improvement and thiamay have accounted to some extent for the lower blood sugars after cure of the infection.

Case No. 5. Male. 53 years of age. Bus Conductor.

Diabetes for 8 years. Deafness in his R. ear since 1915 following tonsillitis. He had a 3 months history of purulent discharge from this ear - diagnosed now as chronic otitis media. He gave a 4 years history of occasional tingling sensations of his legs, but no abnormality was noted to account for this.

Sinuses: Mucous membrane thickening of L. antrum was noted. It was not

Case No. 5 (Contd.)

considered to be a septic focus.

Aural Discharge: Staph. aureus.

W.B.C. = 15,000 per c.mm.

Treatment: Penicillin 100,000 units 6 - hourly for 14 days.

Saline & 2% Ephedrine aural drops T.I.D. for 1 month.

Blood sugars.	Average.	E.S.R.	Insulin.
On infection. 222:343:200:220	246	25	36 P.Z.1.
After " 177:187:159:150	168	4	36 P.Z.1.
After 3 mths. 140:184:190:194	177	5	36 P.Z.1.
After 6 mths. 138:174:143:190	161	7	36 P.Z.1.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 6, Housewife - age 49.

Diabetes mellitus for 8 years. Admitted because of severe pruritus vulvae. Symptoms suggestive of moderate cardiac insufficiency and she complained of pain down the back of the R. leg thought to be part of the sciatic syndrome.

Vulvar rash: Staphylococcus albus in excess of normal.

Blood Culture: Staphylococcus albus. ? contaminant.

Treatment: Sulphatriad gm. ½ T.I.D. for 18 days.

Castellani's paint to vulvar region for 12 days.

Case No. 6 (Contd)

	Blood Sugars	Average	E.S.R.	Insulin
On infection	150: 282: 282: 200	229	16	Nil
After cure	124: 122: 143: 112	125	4	Nil
After 3 months	230: 220: 170: 210:	208	7	Nil

Time for E.S.R. to fall to normal = 3 weeks.

The cardiac condition showed a slight improvement with rest in bed and may have had an effect on the blood sugar improvements. The figures at 3 months have shown a rise but not to the original figures as they were on infection. No septic focus was demonstrable and the figures were thought to be due to an increasing severity of the diabetic condition.

Case No. 7 Housewife Age 64.

3 years history of diabetes mellitus. Recent dyspnoea on exertion. 1 month's history of cough with muco-purulent sputum. Previous history of pneumonia 3 years ago. On examination noted to be overweight, bilateral varicose veins especially on the right. B.P. = 190/110 Rhonchi and fine rales audible at both bases.

Chest: Unresolved pneumonia at R. base. Serial X-rays showed resolution.

Sputum: pneumococci.

W.B.C. = 14,000 per c.mm.

Treatment: Breathing exercises.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	290: 300: 230: 250:	268	68	20 P.Z.1.
" "	246: 260: 210: 214:	233	27	20 P.Z.1 .
After infection	170: 190: 150: 190:	175	8	20 P.Z.1.

Case No. 7 (contd.)

	Blood Sugars	Average	E S.R.	Insulin
After 3 months	140: 148: 132: 172:	148:	7	20 P.Z.1.

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 8. Male Age 63 Miner.

8 weeks' history of weakness and glycosuria noted then. He is subject to colds and for 1 year has had cough with slight spit. 3 months ago he had furunculosis of L. axilla;

1 year ago he had a R. sided pleurisy.

Sinuses: Polyp of R antrum - no evidence of infection.

Chest: Generalised reticulation, probably pneumokoniosis.

L basal pleural thickening.

Throat: Haemolytic streptococcus

W.B.C. = 16,000 per c. mm. for 3 days.

Skin: Septic spots on R. arm - no organism isolated.

Treatment: Penicillin 100,000 units 6 - hourly for 6 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	170: 150: 120: 140:	145	13	16 P.Z.1.
" "	184: 148: 124: 150:	152	17	16 P.Z.1.
After infection	154: 130: 122: 130:	134	3	16 P.Z.1.
After 3 months	122: 124: 118: 122:	122	7	16 P.Z.1.

Time for E.S.R. to fall to normal = 1 week.

The furunculosis of L. axilla which had been present 3 months previously may still have had an effect in raising the initial blood sugar figures.

Case No. 9. Housewife. age 67.

Diabetes mellitus for 15 years. Subject to winter cough and recently complaint of increasing dyspnoea on exertion.

She was of thin build, there was evidence of arterio - sclerosis B.P.= 155/98. Fundi showed silver wiring of the arteries. Tonsils were enlarged. No urinary symptoms.

Urine: Pyuria. B. coli.

Treatment: Sulphathiazole. gm. ½ T.I.D. for 7 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	167 194 170 133	166	10	40 P.Z.I.
After Infection:	174 190 172 164	175	10	" " "
After 3 months:	159 178 164 158	165	7	" " "
After 6 months:	149 172 160 156	159	5	" " "

This is the doubtful case referred to in the text and in which the E.S.R. was at the upper limit of normal, ? abnormal.

Case No. 10. Housewife. age 69.

Diabetes mellitus for 18 months. Subject to cough with purulent sputum for many years. For several years she had been subject to nausea and vomiting, 1 hour after meals and was subject to diarrhoea. Relief by Magnesium Trisilicate and Tincture of Belladonna. She also has had "Rheumatism" for 6 months. She was thin, there was slight ankle oedema and reduplication of the 1st cardiac sound. No urinary symptoms.

Urine: Pyuria. B. coli. grown on culture.

Treatment: Sulphatriad gm. ½ 6 - hourly for 10 days.

Case No. 10 (contd.)

	Blood Sugers.	Average	E.S.R.	Insulin
On infection	185: 187: 145: 180	174	24	20 P.Z.1.
After infection	150: 178: 144: 146:	155	6	20 P.Z.1.
After 3 months	142: 166: 146: 138:	148	4	20 P.Z.1.
After 6 months	138: 148: 140: 142:	142	8	20 P.Z.1.

Time for E.S.R. to fall to normal = 2 weeks.

There was no clinical or radiological evidence to support history of chest complaints.

Case No. 11. Male - age 49 Coal Merchant.

Symptoms suggestive of diabetes for 2 years but glycosuria first noticed when he developed a carbuncle of neck 6 weeks previous to admission. He had been treated before admission with Penicillin and Insulin. He had symptoms of digestive discomfort and a duodenal ulcer was confirmed. Mother had diabetes. He had a large carbuncle with several discharging sinuses.

Carbuncle: Staphylococcus aureus.

W.B.C. = 14,000 per c.mm. for 27 days.

Temperature = Showed occasional spike to 100° for first 4 days.

Treatment: Penicillin 100,000 6- hourly for 60 days.

" 50,000 " locally for 31 days.

Case No. 11 (contd.)

	Blood Sugars	Average	E.S.R.	Insulin
On infection	164: 160: 208: 168	175	51	36 P.Z.I. + 20 Sol. a.m.
" "	198: 205: 208: 188	200	22	36 P.Z.I. + 20 Sol. a.m.
After infection	177: 176: 152: 169	169	3	" "
in 3 months	130: 150: 130: 140	138	8	36 P.Z.I. + 20 Sol. a.m.
in 6 months	128: 142: 136: 128	134	8	" "

Time for E.S.R. to fall to normal = 2 months.

Case No. 12. Housewife age 45.

Diabetes for 9 months. For 4 months, she had complained of a severe vulvar irritation going on to give a small pustular rash of the lower abdomen. There was a 4 years history of pain in the L. hip region, diagnosed as due to osteo-arthritis. Her mother is a diabetic.

Treatment: Penicillin 100,000 units 6-hourly for 9 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	214: 185: 166: 150	179	18	Nil
After "	150: 151: 160: 150	153	7	Nil
After 3 mths.	145: 122: 120: 122	127	5	Nil
After 6 mths.	138: 126: 118: 130	128	6	Nil

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 13. Housewife Age 65.

Diabetes for 8 years; 4 months history of dyspnoea, listlessness, headache, giddiness and anorexia all being due to myocardial insufficiency. B.P = 160/90. Liver was palpable 2 fingerbreadths

Case No. 13 (Contd.)

below costal margin; E.C.G. showed bundle branch block. Toes of left foot were numb and vibration sense was absent from both legs and Pernicious anaemia was diagnosed. No urinary symptoms.

Temperature: 100° on one occasion, otherwise normal.

Urine: Pyuria. B. coli grown. Albuminuria, moderate in degree.

Haemoglobin: 8·5 gms. Marrow was megaloblastic.

Treatment: Anahaemin.

Sulphatriad gm. ŧ T.I.D. for 16 days.

Potassium Citrate and Sod. Bicarb. gr. xxx aa for 16 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	164 178 169 188	175	31	16 P.Z.I.
After Infection:	130 155 142 131	140	5	" " "
After 3 months:	126 138 120 124	127	8	" " "
After 6 months:	129 134 128 132	131	6	" " "

Time for E.S.R. to fall to normal = 3 weeks.

There was slight improvement in the cardiac condition corresponding with blood level improvement and this may account in some measure for the improved blood sugar figures.

Case No. 14. Housewife. age 73.

Diabetes for 10 years. Recent exacerbation of diabetic symptoms and eyesight failing for 5 years. She had bilateral cataract and fine rales at both lung bases. She developed slight dysuria while under

Case No. 14 (contd.)

observation.

Urine: Pyuria: occasional hyaline caste: Staph. albus

Treatment: Sulphatriad gm. ½. T.I.D for 10 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before Infection	203: 198: 174: 193	192	7	Nil
On Infection	214: 203: 192: 205	204	14	Nil
After infection	200: 206: 194: 200	200	7	Nil
After 3 months	200: 189: 176: 190	189	4	Nil

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 15. Housewife age 57.

Diabetes Mellitus for 2 years. Admitted with symptoms suggestive of R renal colic. Gradual loss of weight recently. She was over-weight and tenderness was present in the R. renal area. I.V.P. revealed no abnormality. Osteo-arthritis of spine noted.

Urine: Pyuria, B. coli isolated.

Treatment: Atropine gr. 1/100 S.O.S. Trasentin tabs. ½ S.O.S.

	Blood Sugars	Average	E S.R.	Insulin
On infection	225: 210: 205: 200	210	8	Nil
After infection	210; 223: 196: 200	207	4	Nil
After 3 months	204: 231: 199: 203	209	3	Nil

Case No. 16: Housewife: age 70.

Diabetes for 3 years: Subject to dyspnoea and ankle oedema and found to have auricular fibrillation, soft heart sounds. B.P. 160/84. Complaint of "rheumatics" for many years; rheumatoid arthritis noted. No urinary symptoms.

Urine: Pyuria. B. coli.

Treatment: Sulphatriad gm. ½ T.I.D for 12 days.

Pot. Citrate & Sod. Bicarb. gr xxx aa during same period.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	258: 250: 214: 188	228	20	8 P.Z.I.
After infection	148: 179: 153: 139	155	9	8 P.Z.I.
After 6 months	146: 152: 148: 152	150	8	"

Time for E.S.R. to fall to normal = 2 weeks.

The question arose as to whether the raised E.S.R. was due to the urinary infection or rheumatoid condition. As the rheumatoid condition remained clinically the same and no specific measures were directed toward it, the pyuria was regarded as the infective focus.

Case No. 17: Male: age 67 Rigger.

Carbuncle of neck for 2 weeks and glycosuria first noted at this time. He had been subject to boils when much younger. There were no other relevant findings. Heavy build.

Carbuncle: Staph. pyogenes aureus.

W.B.C. = 16,000 per c. mm. for 10 days.

Treatment: Penicillin 100,000 units 6-hourly for 8 days.

Case No. 17 (contd.)

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	230: 235: 170: 195	208	36	Nil
After infection:	170: 120: 130: 130	138	7	Nil
After 3 months	144: 120: 118: 126	127	5	Nil
After 6 months	138: 122: 114: 128	126	7	Nil

Time for E.S.R. to fall to normal = 2 weeks.

In this case, the general diabetic regime may have been a cause of the blood sugar improvement but it was not all considered due to this as there was such a quick improvement on treatment.

Case No. 18. Housewife: age 52.

Diabetes for 6 years. 6 months history of pruritus vulvae and stress incontinence. She was overweight. B.P 200/114, a systolic murmur was audible at all areas. Fundi showed silver wiring of the arteries. Radiologically, the heart was of hypertensive shape.

Vulvar Rash: Staph. Pyog. aureus.

Treatment: Anterior and posterior colporrhaphy. Cervical flood repair.
Sulphamerazine gm 1 - 6 - hourly for 11 days.

	Blood Sugars.	Average	E.S.R.	Insulin.
On infection:	214 230 200 208	213	23	20 P.Z.I.
After infection:	220 228 190 192	208	10	20 P.Z.I.
After 3 months:	180 214 176 212	196	10	20 P.Z.I.

Time for E.S.R. to return to normal = 2 weeks.

Case No. 19. Housewife: age 57.

Diabetes for 8 years. She had a chronic cough especially in the winter; findings, including radiology were in keeping with a diagnosis of chronic bronchitis. 2 abdominal masses were palpable ? liver and spleen or kidneys. Despite exhaustive investigations, no conclusion was reached. They had disappeared by time of 6 monthly review.

Temperature: 100° for 2 days.

Urine: Pyuria. B. coli

W.B.C. = 13,000 per c.mm for 5 days.

Treatment: Sulphatriad gm 1 T.I.D. for 1 month.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	260 280 220 214	244	12	36 P.Z.I.
After Infection:	274 262 232 212	245	8	36 P.Z.I.
After 3 months:	224 212 188 207	208	8	36 P.Z.I.
After 6 months	214 208 178 204	201	9	36 P.Z.I.

Time for E.S.R. to fall to normal = 4 weeks.

Her chronic bronchitis remained stationary and the sputum was never purulent. Most of the investigations here were done during spring and summer and this may have accounted for mild symptoms.

Case No. 20. Male: Age 50: Craneman.

Diabetes for 6 years: 2 years history of "neuritic" pains, weakness and paraesthesias of both legs and found to have a peripheral neuritis of both legs more marked on the left. 2 weeks history of similar pains in shoulders and found to have a fairly severe peripheral neuritis of L. shoulder and arm. These responded satisfactorily except

for slight residual weakness of L. hand extensor muscles.

Teeth: $\overline{6}|$ showed root abscess: staph. albus

Skin: Blister of foot but fluid sterile.

Treatment: Dental extraction $\overline{6}|$

Penicillin 50,000 6-hourly for 9 days.

Blister incised.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	230: 222: 212: 300	241	29	36 P.Z.I. & 10 Soluble a.m.
After infection	180: 200: 120: 120	155	7	" "
After 3 months	192: 214: 190: 170	192	4	" "

Time for E.S.R. to fall to normal = 2 weeks.

The fact that 3 monthly blood sugars had risen considerably from those after infection was thought to be due to an increase in severity of the diabetic state. No septic focus was found at this time.

Case No. 21. Male: age 25: Quarryman.

6 months history of symptoms suggestive of diabetes. He was admitted in a pre-comatose state. Apart from evidence of loss of weight and acidosis, there were no other relevant findings. He developed frequency of micturition after stabilisation.

Urine: Pyuria. B. coli.

Treatment: Sulphatriad gm. $\frac{1}{2}$. T.I.D. for 8 days.

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection	146: 178: 154: 149:	151	4	20 ~~P.Z.I.~~
On infection	202: 226: 233: 210	218	15	20 P.Z.I.
After urinary infection	160: 190: 164: 163	169	5	20 P.Z.I.
After 3 months	148: 182: 150: 148	155	1	20 P.Z.I.
After 6 months	152: 184: 148: 150	159	8	20 P.Z.I.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 22. Male: age 23; labourer.

Admitted because of acute onset of diabetic symptoms of 1 month's duration. Apart from loss of weight there were no other abnormal findings. Developed an acute tonsillitis after stabilisation.

Throat: Haemolytic streptococci. No general upset.

Treatment: Penicillin lozenges 1 - 4 hourly for 14 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before infection	189: 203: 164: 182	185	4	36 P.Z.I.& 20 Sol. a.m.
On infection	175: 240: 121: 173	177	24	36 P.Z.I & 20 Soluble a.m.
After infection	236: 276: 161: 175	212	3	36 P.Z.I.& 20 " "
After 3 months	224: 238: 152: 184	200	7	" " " "
After 6 months	212: 208: 148: 154	181	4	" " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 23. Housewife: age 50.

Diabetes for 3 years. 2 years history of vague backache relieved by rest and massage. No cause for this was found. There was a systolic murmur at the mitral area and right tympanic membrane was ruptured and dry.

Temperature: Spikes of 99° on 2 days only.

Urine: Pyuria; no growth obtained.

Treatment: Pot. Citrate and Sod. Bicarb. gr. xxx aa Q.I.D. for 1 month.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	182: 206: 192: 216	199	2	36 P.Z.I.
After infection	170: 180: 200: 240	198	5	36 P.Z.I.
After 6 months	166: 190: 212: 216	196	5	36 P.Z.I.

Case No. 24. Housewife. age 61.

Diabetes for 4 months. Well controlled on diet alone. Admitted as acute cholecystitis of 2 days' duration. She was markedly overweight, there were signs of acute cholecystitis, transverse cardiac enlargement was noted. B.P. = 165/95. Osteo-arthritis of the lumbar spine was noted.

Temperature: 101° for 24 hours at beginning of cholecystitis.

Urine: Pyuria. B. coli. grown. This noted after cholecystitis cleared.

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

Sulphatriad gm. T.I.D. for 8 days for urinary infection.

	Blood Sugars.				Average.	E.S.R.	Insulin.
Before Infection	100	98	99	103	100	7	Nil.
On Cholecystitis	120	120	120	120	120	16	Nil.
After "	96	89	99	88	93	3	Nil.
After 3 months:	94	92	100	92	95	7	Nil.
On Urinary Infection:	102	94	94	104	99	8	Nil.
After " "	110	102	96	107	101	5	Nil.
After 3 months:	104	100	98	112	104	4	Nil.

Time for E.S.R. to fall to normal = 1 week.

Case No. 25. Male. age 25. Labourer.

Diabetes for 3 years.

Teeth: Marked crown caries and alveolar absorption.

Treatment: 2 dental extractions.

	Blood Sugars.				Average.	E.S.R.	Insulin.
On Infection:	220	210	160	220	203	26	44 P.Z.I.& 10 Sol.a.m.
On Infection:	220	140	180	204	186	10	" " " " " "
After Infection:	104	100	180	200	146	4	" " " " " "
After 3 months:	140	150	140	162	148	4	" " " " " "

Case No. 25. (Contd.)

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 26. Housewife. age 65.

Diabetes for 1 year. She had a rash in recent months of arms and feet and nails were brittle, the condition being diagnosed as psoriasis.

Skin: Psoriasis.

Treatment: Brilliant green paint to rash for 2 weeks.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	164 166 139 148	154	60	Nil.
On Infection:	180 176 152 144	163	45	Nil.
After 3 months:	148 140 138 142	142	6	Nil.

Blood sugars were not carried out on cure of the infection.

Time for E.S.R. to fall to normal was 4 weeks.

Case No. 27. Housewife. age 67.

Diabetes for 1 year. Early paralysis agitans diagnosed shortly after she was first seen. While an in-patient she developed diarrhoea with some abdominal pain. As several other patients had the same symptoms it was thought that it might be of an infective type. Examination revealed occasional extra systoles and early paralysis agitans.

Rectal Swab: No organism isolated.

Faeces: No organism isolated.

Treatment: Bismuth Carb. - Tannin Albuminate powders for 4 days.

Case No. 27 (contd.)

	Blood Sugars	Average	E.S.R.	Insulin.
Before infection	240: 229: 194: 204	217	7	24 P.Z.1.
On infection	280: 210: 212: 240	236	23	24 P.Z.1.
After infection	242: 204: 196: 206	212	6	24 P.Z.1.
After 3 months	248: 232: 198: 212	223	3	24 P.Z.1.

Time for E.S.R. to fall to normal = 1 week.

Case No. 28: Male: age 18: Clipper.

Rather acute onset of diabetic symptoms during the previous month. He had a sore throat for a few days during this time. On admission he was in a pre-comatose condition but apart from signs associated with this, there was no organic abnormality demonstrable.

Teeth: $\overline{6|}$ & $|\overline{7}$ septic roots.

Treatment: Extraction of the above roots after stabilisation.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	144: 169: 140: 138	148	23	Soluble 10 units T.I.D.
After infection	130: 140: 130: 140:	135	4	" " " "
After 3 months	136: 120: 118: 109:	121	3	" " " "
After 6 months	138: 128: 112: 114:	123	4	" " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 29. Male; age 48 Foreman process worker.

Diabetes for 12 years. He had vague digestive upset symptoms but no lesion to account for these was noted. Previous to admission he had been having slight hypoglycaemic symptoms for 1 week and he was admitted in coma which rapidly responded to intra-venous glucose.

Case No. 29 (contd.)

There were no other organic abnormalities noted. Developed sore throat but no general upset.

Throat: Haemolytic Streptococci.

Treatment: Pencillin lozenges 1 - 4 hourly for 3 days.

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection	214: 234: 200; 210	215	7	36 P.Z.1.
On infection	200: 240: 190: 200	208	10	36 P.Z.1.
After 3 months	212: 242: 202: 204	215	7	36 P.Z.1.
After 6 months	220: 238: 212: 210	220	9	36 P.Z.1.

Case No. 30. Housewife: age 61.

Diabetes for 5 years. Admitted because of injection-abscess of R. arm. History of dyspnoea on exertion and ankle oedema. She was overweight, there was an abscess of the R. arm, legs were puffy.

B.P. = 146/82 and Cardiac sounds were of moderate degree.

Temperature: Occasional 99° in the evening for 6 days.

Skin Abscess: Staph. pyogenes aureus.

W.B.C. = 14,000 per c.mm.

Treatment Abscess incised. Penicillin 100,000 6- hourly for 12 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before infection	130: 134: 129: 130	131	4	40 P.Z.1.
On infection	177: 155: 114: 167	153	98	40 P.Z.1.
On infection	163: 161: 155: 192	168	40	40 P.Z.1.
After infection	131: 136: 122: 128	129	2	40 P.Z.1.
After 3 months	128: 138: 126: 132	131	8	40 P.Z.1.

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 31: Housewife: age 57.

Diabetes for 9 years. There were no special findings in this case. No throat symptoms.

Throat: Haemolytic Streptococci.

Treatment: Penicillin 100,000 units 8 - hourly for 8 days.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	204: 212: 145: 192	188	20	36 units P.Z.1.
After infection	178: 144: 150: 170	161	8	36 " P.Z.1.
After 3 months	182: 166: 142: 162	163	4	36 " "
After 6 months	192: 174: 154: 164	171	7	36 " "

Time for E.S.R. to fall to normal = 1 week.

Case No. 32: Male: age 41: Farm labourer.

Glycosuria noted on a medical examination; as he is a displaced person, difficulty was experienced in obtaining a history but there was thought to be frequency of micturition. Tongue was dirty, many teeth were carious.

Teeth L. lower molars showed apical infection: staphylococci.

W.B.C. = 13,000 per c.mm. for 5 days.

Treatment: Dental extraction.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	212: 242: 190: 216	215	21	40 P.Z.1.
After infection	180: 184: 164: 188	179	9	40 P.Z.1.
After 3 months	182: 194: 160: 182	180	7	40 P.Z.1.

No follow up after this since patient was transferred from the district.

Time for E.S.R. to fall to normal = 1 week.

Case No. 33 Housewife: age 47.

Diabetes discovered few months ago. She had been subject to pruritus vulvae, worse in recent months, for 12 years. A vulvar and lower abdominal dermatitis was noted. For many years subject to giddy turns and dyspnoca on exertion: B.P. = 160/100, fundi showed silver wiring of the arteries. She also had a hoarse voice and a fibroma of vocal cord was noted. Transverse cardiac enlargement was noted.

Skin: Staph. aureus.

Treatment: Lotio Calamine c 2% Phenol for 3 weeks.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	222: 214: 180: 210	207	20	24 P.Z.1.
On infection	238: 244: 224: 218	231	28	24 P.Z.1.
After 3 mths.	214: 208: 186: 204	203	9	24 P.Z.1.
After 6 mths.	208: 200: 182: 192	196	5	24 P.Z.1.

Time for E.S.R. to fall to normal = 3 weeks.

No blood sugars were done on cure of infection.

Case No. 34. Housewife: age 55.

Diabetes for 4 years. She gave a 4 year history of symptoms suggestive of gall bladder disturbance. She had been losing weight recently, L. ear was discharging for 2 months but was dry when seen and a partially healed perforation was noted. For 1 month she had been troubled with peri-anal furunculosis. Examination revealed, in addition to the above, chronic myeloid leukaemia for which she obtained X-ray therapy. She was hypertensive, B.P = 170/100 E.C.G; showed myocardial disease.

Case No. 34. (Contd.)

Skin - Furunculosis = Staph. aureus.

Treatment: Penicillin 100,000 units 6 - hourly for 10 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	186: 193 184 198	188	4	20 P.Z.I.
On Infection:	192 229 176 231	207	16	" " "
After Infection:	184 192 180 196	188	2	" " "
After 3 months:	192 196 186 202	194	4	" " "

Touch was lost with this patient after this.

Time for E.S.R. to fall to normal = 2 weeks.

Perhaps too great reliance cannot be placed on this case because of the presence of leukaemia which may have affected both tolerance and E.S.R.

Case No. 35. Housewife: age 60.

Diabetes for 4 weeks, the onset of her diabetic symptoms co-inciding with the appearance of an itching rash on the trunk. The rash consisted of small papules all over the trunk. She was overweight but no other abnormal finding was noted.

Skin rash: Staph. albus. ? normal commensals.

W.B.C. = 17,000 per c.mm. for 1 week.

Treatment: Penicillin. 50,000 units 6 - hourly for 7 days.

Lotio Calamine c 2% Phenol for 3 weeks.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	180 190 170 220	193	50 25	Sol a.m.&10 Sol p.m.
On Infection:	162 170 182 190	176	22	" " " "
After Infection:	174 157 127 134	148	10	" " " "

Case No. 35 (contd.)

	Blood Sugars.	Average	E.S.R.	Insulin
After 3 months	162: 168: 120; 130	145	7	25 Sol.A.M. & 10 Sol P.M.
After 6 months	142: 148: 116: 122	132	9	" "

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 36. Housewife; age 57.

Diabetes for 1 year. 6 months history of cloudy urine and haematuria at intervals, burning pain at end of micturition. Diagnosis was made of R. ureteric calculus with hydro nephrosis and hydro ureter. A R. nephrectomy was done after some months under observation. Overweight but no other abnormality. Her mother and sister have diabetes. Renal function was good.

Urine: Pyuria. B. coli.

Treatment: Sulphatriad gm ½ T.I.D. for 1 month.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	308: 235: 233: 280	264	37	8 P.Z.1.
On infection	236: 219: 218: 214	222	18	8 P.Z.1.
After 3 months	218: 194: 182: 212	202	22	8 P.Z.1.
After Nephrectomy	216: 208: 190: 198:	203	12	8 P.Z.1.
After 3 months	214: 186: 174: 188	191	8	8 P.Z.1.

Time for E.S.R. to fall to normal = 4 months.

It is apparent that nephrectomy removed the septic focus within the kidney. The second "on infection" was taken when the urine was sterile but E.S.R. remained elevated.

Case No. 37. Housewife. age 37.

Diabetes for 9 years. 6 months ago she developed a boil of R. axilla and it required incision. Recently increasing dyspnoea and ankle oedema which was evident. A systolic murmur was audible at all areas. B.P.= 170/86. Shewas overweight. Furunculosis of L. axilla noted and this had been increasing for 4 weeks.

Radiologically cardium was of hypertensive configuration.

Skin boils: Staph. aureus.

Treatment: Penicillin 100,000 units 6 - hourly for 11 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	234 246 212 220	228	3	20 P.Z.I.
On Infection:	282 293 236 240	263	22	" " "
After Infection:	242 262 218 224	237	7	" " "
After 3 months:	230 240 215 220	226	4	" " "
After 6 months:	242 254 210 218	231	2	" " "

Time for E.S.R. to fall to normal = 2 weeks.

Myocardial degeneration findings remained fairly constant, during investigation. If anything, there was a slight improvement.

Case No. 38. Male. age 47. Butcher.

On medical examination glycosuria was found and diabetes was confirmed. There was no other abnormality. He was of thin build and had acute pleurisy 10 years ago. He developed an acute tonsillitis.

Throat: Haemolytic streptococci.

Treatment: Penicillin lozenges 1 - 4 hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	183 190 122 179	149	3	Nil.

Case No. 38. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	210 230 124 194	189	13	Nil.
After Infection:	180 185 124 190	170	9	Nil.
After 3 months:	192 186 128 176	171	8	Nil.
After 6 months:	178 192 122 156	162	5	Nil.

Time for E.S.R. to fall to normal = 1 week.

Case No. 39. Male: age 31. Dye worker.

Diabetes for 8 years. He first came under observation after receiving phrenic crush and pneumoperitoneal therapy for a L. lung tuberculosis. He was receiving refills during the course of the observation. Apart from the signs of his therapy, the only abnormality noted was the presence of 2 small circular haemorrhages in the R. fundus, probably diabetic in origin.

Chest: Tuberculosis - receiving therapy.

Treatment: as outlined above.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	144 152 112 144	138	3	40 Sol. at 7 a.m. 25 Sol. at Noon, 30 at 6.30 p.m.
Later in Infection:	152 148 108 139	137	6	" " " "
After 3 months	148 146 114 122	135	4	" " " "

Still receiving therapy for his pulmonary condition.

Case No. 40. Housewife: age 55

Diabetes for 6 years. She was overweight; there was bilateral varicose veins. B.P. = $\frac{200}{108}$ and fundi showed silver wiring. There was

Case No. 40. (Contd.)

slight sepsis of both great toes. Subject to painful knee joints; 18 months previously she had a crop of boils. Radiologically, heart shadow showed a hypertensive shape. Skin. - Staph. aureus from toes. Penicillin sensitive.

Treatment: Penicillin powder daily for 6 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	240 252 216 238	237	12	40 P.Z.I.
After Infection:	236 212 195 204	212	8	" " "
After 3 months:	228 208 198 212	212	10	" " "
After 6 months:	246 238 218 224	232	8	" " "

Time for E.S.R. to fall to normal = 1 week.

Case No. 41. Male. age 14. Schoolboy.

Admitted in pre-comatose state. He gave a 6 months history of symptoms suggestive of diabetes and 3 weeks previous to admission he had complained of nausea, vomiting and diarrhoea. Apart from signs associated with his pre-comatose state, no abnormality was noted. Developed a slight sore throat after stabilisation.

Throat: Haemolytic streptococci.

Treatment: Penicillin lozenges 1 - 2 hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	194 186 192 200	193	4	20 Soluble a.m. & p.m.
On Infection:	220 190 192 184	197	8	" " " "
After Infection:	218 178 184 192	193	5	" " " "

Case No. 41. (Contd.)

	Blood Sugars.	Average	E.S.R.	Insulin
After 3 months:	202: 194: 194: 204	199	8	20 Sol. a.m. & p.m.
After 6 months:	212: 184: 200: 192	197	7	20 Sol. a.m. & p.m.

Time for E.S.R. to fall to normal = 1 week.

Case No. 42. Female: age 52. Housewife.

Diabetes for 4 years. She had a recent complaint of tiredness and nervousness. She was overweight, of pale appearance, and was hypertensive, B.P = 200/120 and fundi showed silver wiring of the arteries. Developed dysuria.

Urine: Pyuria. B coli organism isolated.

Treatment: Sulphatriad gm 1 - 8 hourly
Pot. Citr. and Soda Bicarb. gr xxx as T.I.D. } for 10 days.

	Blood Sugars.	Average	E.S.R.	Insulin
Before Infection:	159 166 131 139	149	7	8 P.Z.I. a.m.
On Infection:	182 194 146 174	174	25	8 P.Z.I. a.m.
After Infection:	164 170 122 143	150	7	8 P.Z.I. a.m.
After 3 months:	158 159 128 134	145	8	8 P.Z.I. a.m.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 43. Female: age 57. District Nurse.

History of symptoms suggestive of diabetes for 5 months. There was a soft blowing systolic murmur at all areas. There was a history of a very mild dermatitis of the fingers due to dettol.

Case No. 43. (Contd.)

Throat: Few haemolytic streptococci. Symptomless.

Treatment: Penicillin lozenges 1 - 2 hourly for 3 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	174 162 130 148	154	21	Nil.
After Infection:	168 164 142 146	155	8	Nil.
After 3 months:	138 172 138 136	154	7	Nil.
After 6 months:	158 162 142 138	150	7	Nil.

Time for E.S.R. to fall to normal = 1 week.

Case No. 44. Female: age 62. Housewife.

Diabetes for 4 months. She complained of paraesthesiae of 3rd and 4th fingers and palm of R. hand but no cause was found. She was obese, plethoric and hypertensive; B.P. = $\frac{270}{136}$ and fundi showed silver wiring. She gave a vague history of "bladder trouble" 1 year ago. Radiologically in addition to left ventricular enlargement there was slight basal congestion. Developed a dryness of the throat with slight infection.

Throat: Haemolytic streptococci.

Treatment: Penicillin lozenges 1 - 2 hourly for 3 days followed by penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	200 208 194 196	200	8	Nil.
On Infection:	230 236 184 193	211	17	Nil.
After Infection:	204 212 178 182	194	9	Nil.
After 3 months:	202 206 184 192	196	9	Nil.

Time for E.S.R. to fall to normal = 1 week.

Case No. 45. Housewife. age 29.

Diabetes for 2 years. At all times she was regarded as being very unstable as regards her blood and urinary sugars.

Sinuses: L. maxillary polyp but opinion that no source of sepsis was noted and no measures were taken.

Skin: Axillary rash, probably tinea. No organism other than normal skin commensal was isolated.

Treatment: Whitfields Ung. B.D. for 7 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	168 170 158 183	170	10	40 P.Z.I. A.M. & 16 Sol. p.m.
After Infection:	179 148 116 133	169	8	" " " " " "
After 3 months:	300 250 190 240	245	9	" " " " " "
After 6 months:	284 278 156 190	227	8	" " " " " "

In view of the previous history of instability of blood and urinary sugars, it was felt that the figures in this case at 3 and 6 months, were due to an exacerbation of her diabetes. No infective or other cause was noted for this.

Case No. 46. Male age 75. Retired Miner.

Diabetes for 4 months. In recent years, complaint of dyspnoea, productive cough and nocturnal frequency. He was overweight, dyspnoeic and there was evident cyanosis. Sacral and ankle oedema were present, cardiac sounds were poor. B.P.= 180/96 E.C.G. was in keeping with chronic coronary occlusion. Rhonchi and rales were audible over both lung fields.

Chest: Chronic Bronchitis.

Sputum: Pneumococci.

Case No. 46 (contd)

Treatment : Penicillin 100,000 units 6 - hourly for 8 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	202: 184: 168: 204	190	19	Nil
After infection	190: 182: 144: 178	174	7	Nil
After 3 months	182: 184: 148: 182	174	8	Nil

Time for E.S.R. to fall to normal = 2 weeks.

Sputum was much cleaner after period of penicillin therapy but evidence of chronic bronchitis remained.

Case No. 47: Housewife: age 51.

Diabetes for several months. She also complained of epigastric pain and flatulence after heavy meals but no cause for this was found. Occasional cramp-like pains in calves on walking, B.P = 160/90 cardiac sounds were of poor quality, there was a soft systolic murmur at the apex. Periods were irregular and heavy. She complained of leucorrhoea. Haemoglobin = 11 gms.

Cervical Swab: Staphylococcus albus.

Treatment: Acetarsol suppositories daily for 2 weeks. No clinical improvement resulted.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	264: 218: 180: 212	219	6	Nil
After treatment	258: 224: 176: 208	217	4	Nil
After 3 months	260: 234: 192: 206	223	5	Nil

At 3 months, the leucorrhoea was very much less and this was without treatment. Despite this blood sugar and E.S.R. findings remained much the same.

Case No. 48 Housewife: age 73.

Diabetes for 4 months. There was a 3 months' history of weakness of L. foot followed by the right and there was evidence of peripheral neuritis of both legs particularly the left. Physiotherapy measures brought about a marked improvement. 3 years previously a L. exophthalmos was noted and she was put on Thyroid and had been having it until 3 months ago. She was pale and there was evident loss of weight. Occasional extra-systoles were noted. B.P. = 220/110 and fundi showed silver wiring.

Throat: Haemolytic Streptococci. Symptomless.

Treatment: Penicillin lozenges 1 - 2 hourly for 3 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	264: 242: 200: 218	231	32	Nil
After infection	244: 222: 174: 182	206	6	Nil
After 3 months	202: 214: 182: 204	201	8	Nil

Time for E.S.R. to return to normal = 2 weeks.

The question arose here as to whether Thyroid therapy had anything to do with the diabetic condition. Thyroid therapy was stopped just before she came under observation and this may have accounted for some of the fall in blood sugars.

Case No. 49: Housewife: age 43.

Diabetes for 3 years; She was admitted as a hypoglycaemic coma but was conscious on admission. 16 years previously she had goitre and while swelling had disappeared occasionally it reappeared during throat

Case No. 49. (Contd.)

infections which responded to iodine. Few months previously she had pain and discharge from the L. ear but appearances were normal; on examination 5 months previously, teeth were extracted because of pyorrhoea. She was overweight and there was evident slight exophthalmos otherwise no clinical abnormality was noted. No urinary symptoms.

Urine: Pyuria. Staphylococcus albus organism isolated.

Treatment: Sulphatriad gm. $\frac{1}{2}$ T.I.D. for 12 days.

Pot. Citr. and Soda Bi-carb. gr.xxx aa T.I.D. for 12 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection.	110 125 230 190	164	17	30 P.Z.I. a.m.
After Infection:	124 142 212 164	161	2	" " "
After 3 months:	128 126 180 157	148	1	" " "
After 6 months:	132 122 178 164	149	8	" " "

Time for E.S.R. to return to normal. = 2 weeks.

There was no evidence of any thyrotoxicosis during the period of observation and so there should have been no influence on the results. She had several infections during the year previous to observation but it was considered that their influence, if any, would have passed.

Case No. 50. Female. age 59. Canteen Worker.

Admitted complaining of jagging pain in the L. loin of 9 weeks duration. Slight cough with mucoid sputum. She was stout, there was slight oedema of the ankles, tenderness in the L. lumbar region and a ---

Case No. 50 (contd.)

soft systolic murmur was audible at the apex. Routine urinary examination revealed glycosuria and blood sugars confirmed her diabetic state.

Chest: Area in L. infra-clavicular region thought at first to be neoplastic but finally considered inflammatory as resolution proceeded.

Treatment: Nothing specific necessary.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	248: 256: 248: 262	254	28	Nil
After infection	236: 242: 225: 248	238	7	Nil
After 3 months	224: 214: 196: 216	213	7	Nil
After 6 months	232: 224: 202: 212	218	4	Nil

Time for E.S.R. to fall to normal = 5 weeks.

Case No. 51 Housewife: age 57.

Diabetes for 4 months. Main complaint was of pruritus vulvae going on to a dermatitis. She was overweight: she had suffered from "rheumatics" for many years but all joint movements were satisfactory. Her mother had diabetes.

Skin: Vulvar dermatitis: Staphylococcus albus was only organism isolated.

Treatment: Penicillin 100,000 units 6 - hourly.) for
Lotio Calamine c 2% Phenol T.I.D. to vulvar region) 10 days

	Blood Sugars	Average	E.S.R.	Insulin
On infection	180: 202: 164: 189	184	10	Nil
After infection	198: 194: 168: 192	188	8	Nil
After 3 months	186: 188: 165: 186	181	9	Nil

Case No. 52. Housewife: age 63.

Mild diabetes for many years. She was admitted as Gastric Carcinoma and gastrectomy performed. She was hypertensive and Haemoglobin = 11.0 gms.

Ba meal: Gastric carcinoma.

Temperature: Occasional 99° for few days post-operatively.

Treatment: Gastrectomy.

	Blood Sugars	Average	E.S.R.	Insulin
Before operation	222: 234: 210: 215	220	41	Nil
After operation	146: 138: 130: 120	134	8	Nil
After 6 months	138: 146: 124: 132	135	4	Nil

Time for E.S.R. to fall to normal = 6 weeks.

Case No. 53. Housewife: age 49.

Diabetes for 13 years. She was of thin build and good colour.

Teeth: Markedly carious.

W.B.C. = 12,000 per c.mm for 3 days.

Treatment: Penicillin 100,000 units 6 - hourly for 6 days.

Teeth extracted.

	Blood Sugars	Average	E.S.R.	Insulin
On infections	222: 236: 198: 224	220	9	24 P.Z.I.
After infections	210: 240: 200; 212	216	6	24 P.Z.I.
After 3 months	216: 228: 204: 218	217	5	24 P.Z.I.

Case No. 54. Male:. age 50; unemployed miner.

2 years history of dyspnoea, ankle oedema and slight productive cough giving brownish sputum. Found to have auricular fibrillation, poor cardiac sounds and B.P. = 140/90. He was dyspnoeic at rest. Glycosuria was found and diabetes diagnosed. He developed a conjunctivitis of the L. eye after stabilisation.

Skin: Conjunctivitis. Staphylococcus albus.

Treatment: Golden Eye ung and Sod. Bicarb. eye baths. T.I.D. for 6 days.

	Blood Sugars.	Average	E.S R.	Insulin
On Infection:	183 174 156 170	171	6	Nil
After Infection:	178 184 152 168	171	4	Nil
After 3 months:	182 164 148 172	167	5	Nil

Case No. 55. Male: age 67. Retired cashier.

Diabetes for 16 years. He complained of low back pain and osteoarthritis was thought to be the cause. He had a dermatitis of the R. thigh for several months. He was of thin build, skin was dry and loose; an occasional extra-systole was noted, B.P. = 220/98; knee jerks were diminished and fundi showed silver wiring.

Skin: Dermatitis of hip; staphylococcus albus. Dry lesions.

Treatment: Cremor Zinci B.D. for 1 month.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	320 346 282 296	311	15	60 P.Z.I.

Case No. 55. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
After Infection:	298 326 276 302	301	8	60 P.Z.I.
After 3 months:	304 318 268 312	301	4	" " "

Time for E.S.R. to return to normal = 1 month. The number of organisms noted was in excess of the normal skin commensals.

Case No. 56. Housewife. age 38.

Diabetes for 11 years. Admitted in hypoglycaemic coma but responded rapidly. For 2 years she had been subject to watery diarrhoea; no blood or mucus had been noted and there was no response to kaolin and opium mixture. There were no other relevant findings.

Sinuses: Slight hypertrophy of R. antral mucous membrane - no treatment advised as not considered a septic focus.

Faeces: No organism isolated but no other cause for elevated E.S.R. was found. Several pus cells were found on examination.

Treatment: Phthallyl - Sulphathiazole gm. 1 - 4 hourly for 8 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	186 204 146 162	175	32	20 P.Z.I.
After Infection:	192 212 154 158	179	2	" " "
After 3 months:	178 192 148 162	170	8	" " "
After 6 months:	184 204 162 182	183	7	" " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 57. Housewife. age 39.

Admitted as renal colic and L. renal calculus found. There was no evidence of any hydronephrosis. Glycosuria was found and diabetes was

Case No. 57 (Contd)

diagnosed. She was overweight and there was tenderness in the L. renal angle.

Temperature: In 101 - 103° region for initial 5 days after admission. Normal during period of blood sugars.

Urine: Pyuria. Staphylococcus albus.

Treatment: Penicillin 200,000 units 8 - hourly for 7 days.

Pot. Citrate and Sod. Bicarb. gr xxx aa T.I.D. for 7 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	230 242 212 224	227	17	Nil.
After Infection:	206 212 182 202	201	2	Nil.
After 3 months:	212 220 190 198	205	8	Nil.
After 6 months:	208 212 202 218	210	9	Nil.

Time for E.S.R. to fall to normal = 1 week.

Case No. 58. Housewife: age 67.

Diabetes for 10 yeare. She was of good colour, B.P. = $\frac{236}{120}$ slight arterio-sclerosis was noted; and there was evidence of aortic calcification. She developed urinary frequency.

Urine: Pyuria. B. coli

Treatment: Sulphatriad gm 1 T.I.D. for 7 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	230 242 210 224	227	4	Nil.
On Infection:	270 244 206 238	240	17	Nil.
After Infection	258 242 210 226	234	9	Nil.
After 3 months:	248 238 212 232	233	10	Nil.

Time for E.S.R. to return to normal = 1 week.

Case No. 59. Housewife: age 50.

Diabetes for 6 months: No abnormality was noted apart from obesity. She developed lichen planus of both forearms.

Skin: Lichen planus. No organism isolated.

Treatment: Donovan's solution = 2 weeks on and 1 week off; whole course taking 6 weeks.

	Blood Sugars	Average	E.S.R.	Insulin
On infection	164: 178: 138: 152	158	9	Nil
After infection	178: 166: 128: 150	155	6	Nil
After 3 months	158: 139: 134: 142	151	8	Nil
After 6 months	178: 172: 144: 160	164	4	Nil

Case No. 60. Housewife: age 65.

Diabetes for several years. She had symptoms suggestive of right sided cardiac failure, sounds were soft, a systolic murmur was audible at the mitral and aortic areas. B.P = 174/82. She was overweight. Urinary infection found on further examination - symptomless.

Urine: Pyuria; B. coli organism isolated.

Treatment: Pot. citr. and Sod. Bicarb gr xxx aa T.I.D. for 10 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before infection	249 242 210 220	230	4	Nil
On infection	284 264 207 222	244	18	Nil
After infection	256 252 212 238	240	9	Nil
After 3 months	259 248 214 221	236	6	Nil

Case No. 60 (contd.)

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 61: Housewife: age 52.

Diabetes for 6 years: She had 1 year's history of pain suggestive of angina pectoris, B.P. = 210/104 and fundi showed silver wiring. She developed a sore throat of moderate severity.

Throat: Haemolytic streptococci.

Temperature = 100° for 3 days.

W.B.C. = 18,000 for 5 days.

Treatment: Penicillin 100,000 units 6 - hourly for 10 days.

	Blood Sugars.	Average	E.S.R.	Insulin.
Before infection	214: 226: 175: 203	204	4	40 P.Z.I. & 8 soluble A.M
On infection	216: 224: 184: 202	209	22	" "
After infection	228: 219: 178: 214	210	2	" "
After 3 months	218: 221: 184: 200	206	4	" "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 62. Housewife: age 63.

Diabetes for 15 years: She complained of recent loss of weight, variation in visual acuity: fundi showed silver wiring of arteries and diabetic retinitis. Complaint of dyspnoea on exertion, cardiac sounds were soft. B.P. = 248/120. There were osteo-arthritis of the R. knee and a degree of peripheral neuritis of the L. leg. Her father died of diabetes. Developed rash while under observation.

Skin: Vulvar and lower abdominal rash.

Case No. 62 (contd.)

Staphylococcus albus.

Treatment: Castellanis paint daily for 14 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before infection	214: 230: 182: 188	204	4	Nil
On infection	230: 214: 182: 212	210	6	Nil
After infection	224: 216: 194: 214:	212	4	Nil
After 3 months	212: 228: 180: 192	203	7	Nil
After 6 months	204: 220: 190: 194	202	5	Nil

Cardiac findings remained stationary during period of observation.

Case No. 63. Female: age 12 ; schoolgirl.

3 months' history of diabetes: No abnormality was demonstrable. She developed diarrhoea but rectal swab revealed no causal organism.

Teeth: Several carious. Septic absorption at $\overline{34}$

No organism was grown from swab apart from normal commensals.

Treatment: Extraction of carious teeth.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	230: 230: 194: 212	217	16	16 Soluble A.M. & P.M.
After infection	220: 210: 182: 146	190	2	" " "
After 3 months	214: 216: 184: 168	196	7	" " "
After 6 months	220: 222: 193: 166	200	10	" " "

Time for E.S.R. to fall to normal = 1 week.

Case No. 64. Housewife: age 69.

Diabetes for 4 years. She gave a history of severe headaches, giddiness, hot and cold feelings of feet but no cause was demonstrable; she had received treatment several years ago for "nerves". Slight dysuria and frequency for several weeks developed while under observation.

Urine: Pyuria: B. coli

Treatment: Sulphatriad gm $\frac{1}{2}$ T.I.D. for 14 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before infection	210: 224: 160: 149	186	4	48 P.Z.1.
On infection	240: 258: 154: 132	196	18	48 P.Z.1.
After infection	236: 232: 168: 174	203	5	48 P.Z.1.
After 3 months	212: 222: 163: 159	189	7	48 P.Z.1.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 65. Housewife: age 45.

Diabetes for 1 month. Main complaint was of pruritus and vulvar dermatitis. She had symptoms of myocardial insufficiency and the cardiac sounds were soft.

B.P = 148/86. She was of average weight.

Skin: Dermatitis: No organism other than normal commensals was isolated.

Treatment: Castellani's paint B.D. for 13 days.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	110: 90: 98: 102	100	17	28 P.Z.1. A.M.
After infection	94: 98: 86: 102	95	8	28 P.Z.1. A.M.
After 3 months	104: 96: 94: 110	101	4	" " "
After 6 months	98: 102: 88: 97	97	7	" " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 66. Housewife. age 60.

Diabetes for 3 years. Complaint of vulvar dermatitis and rash of lower abdomen. Dyspnoes on exertion, nocturia and variable vision, and found to have B.P.= 230/124, systolic murmur at the mitral area and occasional extra-systoles. Liver was enlarged and slightly tender, there were ankle oedema and bilateral varicose veins. Fundi showed silver wiring. Subject to post-nasal catarrh.

Throat: Post-nasal catarrh. Staphylococcus albus.

Treatment: Menthol inhalations and Saline c Ephedrine nasal drops for 14 days. Slight improvement noted.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	260 248 217 232	240	24	16 P.Z.I.
After Infection:	216 208 192 202	205	8	" " "
After 3 months.	222 216 186 194	205	9	" " "
After 6 months:	204 212 192 200	202	7	" " "

Time for E.S.R. to fall to normal = 2 weeks.

The post-nasal catarrh was improved but was not cured. It did not relapse during further period of observation probably due to the fact that this period was over the summer months.

Case No. 67. Housewife. age 47.

Diabetes for 12 years. Main complaint was of pruritus vulvae with several septic spots of abdomen. Dyspnoeic on exertion but no other referable cardiac symptom was elicited. B.P.= 160/100 Fundi showed slight silver wiring. She was overweight.

Case. No. 67. (Contd.)

Temperature: 101° on several occasions in first 3 days.

Skin: Septic spots: staphylococcus aureus.

W.B.C. = 13,000 per c.mm. for 4 days.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On skin infection:	222 236 182 210	213	8	16 P.Z.1.
After " "	214 226 188 216	211	5	16 P.Z.1.
After 3 months	223 214 182 221	208	7	16 P.Z.1.

Case No. 68. Housewife. age 50

Diabetes for 6 years. She was subject to rheumatics but no evidence was noted on examination. She had a slight dry cough, was dyspnoeic on exertion; cardiac sounds were soft. B.P. = $\frac{210}{104}$. She was of a pale, tired appearance. Teeth were very carious. Haemoglobin = 10 gms.

Sinuses: Hypertrophic mucosal thickening and antra were polypoidal. No evidence of any septic focus.

Teeth: Apical infections.

W.B.C. = 12,000 per c.mm. for 5 days.

Treatment: Teeth extracted. Staphylococcus aureus.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	194 182 170 176	181	13	Nil.
After Infection:	186 184 162 172	176	8	Nil.
After 3 months:	178 174 146 150	162	9	Nil.
After 6 months:	180 181 152 153	167	7	Nil.

Time for E.S.R. to fall to normal = 1 week.

Case No. 69. Housewife: age 60.

Diabetes for 4 months. Tingling and numbness of hands and legs, but no cause was noted. She had a small pustular rash of trunk - it had been present for 3 weeks. Overweight.

Skin rash: Staphylococcus albus .

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

Lotio Calam. c 2% Phenol locally for 12 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	180 160 124 130	149	4	20 Soluble a.m. & 10 " p.m.
On Infection:	180 192 171 220	191	50	" " " "
After Infection:	162 170 182 190	176	2	" " " "
After 3 months:	174 157 127 134	148	10	" " " "
After 6 months:	164 158 134 142	153	9	" " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 70. Housewife age 70.

Diabetes for 1 year. Several months history of haematuria at intervals and dysuria. A left renal calculus with hydronephrosis was diagnosed and nephrectomy carried out. Her mother and sister had diabetes.

Urine: Pyuria. B. coli.

W.B.C.s. = 17,000 per c.mm. for 7 days.

Treatment: Sulphatriad gm $\frac{\cdot\cdot}{11}$ 4 - hourly for 5 days and then gm. 1 T.I.D. for further 14 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	308 235 233 280	264	37	8 P.Z.I.
After Infection:	218 214 202 216	213	9	8 P.Z.I.

Case No. 70.(Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
After 3 months:	221 236 200 228	221	9	8 P.Z.I.

Time for E.S.R. to fall to normal = 3 weeks.

Then further infection arose.

Temperature: 100-102° for 5 days.

Throat: Haemolytic streptococci

Treatment: Sulphatriad gm $\frac{14}{11}$ 4 - hourly for 6 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	262 274 244 268	262	43	8 P.Z.I.
On Infection:	246 242 212 236	234	27	8 P.Z.I.
After 3 months:	219 224 198 221	216	7	8 P.Z.I.

No blood sugar figures were obtained just after the infection cleared here. Time for E.S.R. to return to normal was 3 weeks - it is not entered here.

Case No. 71. Male: age 14: Schoolboy.

Diabetes for 1 year. He was admitted in pre-diabetic coma. There were no other abnormalities noted, apart from those associated with his hyperglycaemia. He developed acute tonsillitis while under observation.

Throat: Haemolytic streptococci

Temperature: 99-102° for 3 days.

W.B.C.s. = 16,000 per c.mm. for 7 days.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Mandl's Paint locally T.I.D. for 8 days.

Case No. 71. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	264 220 185 196	216	4	40 P.Z.1.
On Infection:	284 236 204 216	235	38	40 P.Z.1.
After Infection:	274 243 200 224	235	9	40 P.Z.1.
After 3 months:	262 212 190 198	216	9	40 P.Z.1.
After 6 months:	252 221 184 192	212	6	40 P.Z.1.

Time for E.S.R. to return to normal = 2 weeks.

Case No. 72. Male: age 62. Miner.

Diabetes for 1 year. He gave a 5 years history of cough giving a yellowish sputum and clinical and radiological findings were consistent with chronic bronchitis and emphysema. He had been dyspnoeic on exertion in recent months. Haemoglobin = 12 gms.

Sputum: Pneumococcus

Chest: Chronic Bronchitis.

Treatment: Warm alkaline mixture T.I.D. for 4 weeks.

Sputum became less purulent.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	192 164 138 152	162	18	Nil.
After Infection:	200 174 132 148	164	4	Nil.
After 3 months:	184 176 140 146	163	8	Nil.

Time for E.S.R. to fall to normal = 3 weeks.

The sputum became less purulent and chest clearer, but there still remained some residual lesions. There was no flare-up during period of investigation.

Case No. 73. Male. age 54. Turner.

Diabetes for 3 years. Recent history of slight dyspnoea on exertion. Cardiac sounds soft. B.P. 164/98 Slight ankle oedema noted. He developed boils of his neck.

Skin Boils: Staphylococcus aureus isolated.

Treatment: Penicillin 100,000 units 6 - hourly for 14 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	164 174 139 158	159	3	20 P.Z.I.
On Infection:	214 232 192 206	211	42	" " "
After Infection:	198 228 188 202	204	7	" " "
After 3 months:	156 178 142 160	159	9	" " "
After 6 months:	162 174 140 153	157	8	" " "

Time for E.S.R. to fall to normal = 2 weeks.

Myocardial failure symptoms showed slight improvement during period as in - patient and accordingly this may have accounted for some of the improvement in the blood sugars.

Case No. 74. Housewife. age 63.

Diabetes for 4 months. For many years she has been subject to gall-bladder symptoms but no cause for these had been demonstrated. For 3 years complaint of slight urinary frequency particularly nocturia. Two weeks history of dysuria and urine appeared cloudy. Overweight.

Temperature: 98-99° for first 4 days under observation.

Urine: Pyuria: B. coli.

Treatment: Sulphatriad gm. $\frac{\cdot\cdot}{1}$ T.I.D. for 14 days.

Pot. Citr. and Sod. Bicarb. gr.xxx aa T.I.D. for 14 days.

Case No. 74. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	198 203 180 206	197	7	Nil.
On Infection:	202 214 192 218	207	9	Nil.
After Infection:	210 208 184 202	201	6	Nil.
After 3 months:	194 198 179 204	194	8	Nil.
After 6 months:	221 197 191 214	206	4	Nil.

Case No. 75. Female: age 59. Housekeeper.

Diabetes for 5 years. Bilateral varicose veins which were symptomless. Developed septic finger following a wooden splinter. Slight lymphangitis and adenitis noted. Her mother has diabetes.

Temperature: 99-100·6° for 2 days.

Skin Abscess: Staphylococcus aureus isolated

W.B.C.s. = 12,000 per c.mm. for 1 week.

Treatment: Dry heat to finger.

Penicillin 100,000 units 6 - hourly for 8 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	189 179 150 178	174	7	Nil.
On Infection:	213 232 184 201	206	36	Nil.
After Infection:	200 202 174 191	192	2	Nil.
After 3 months:	198 174 154 183	177	9	Nil.
After 6 months:	184 180 148 163	169	8	Nil.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 76. Housewife: age 68.

Diabetes for 4 years. Dyspnoea on exertion, slight cough with

Case No. 76. (Contd.)

yellowish sputum and signs were those of chronic bronchitis. Occasional ankle oedema noted; the cardiac sounds were soft with an occasional extra-systole. B.P. = $\frac{164}{98}$

Chest: Appearances consistent with chronic bronchitis.

Sputum: Purulent. Pneumococcus.

Treatment: Warm alkaline mixture T.I.D. for 14 days.

Penicillin 100,000 units 6 - hourly for 14 days.

Sputum much cleaner after treatment.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	204 216 190 212	206	4	Nil.
After Infection:	198 219 184 198	200	8	Nil.
After 3 months:	210 216 192 204	206	9	Nil.
After 6 months:	197 208 176 210	198	8	Nil.

While condition was not cured, sputum did appear much cleaner and symptoms were less. Cardiac symptoms and signs showed slight improvement but neither had any effect on the blood sugar figures.

Case No. 77. Male: age 23. Clerk.

Diabetes for 7 years. He developed symptoms and signs of acute appendicitis, and operation was carried out 24 hours after admission.

Infection: Acute appendicitis. No attempt to isolate an organism was made.

W.B.C.s. = 14,000 per c.mm. for 6 days.

Temperature: 99-101° for 3 days.

Treatment: Appendicectomy.

Case No. 77. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	192 183 144 163	171	7	40 P.Z.I. & 12 Soluble a.m.
On Infection:	224 242 202 237	226	27	" " " "
After Infection:	212 200 194 213	205	4	" " " "
After 6 months:	184 176 132 157	162	9	" " " "

Time for E.S.R. to fall to normal = 2 weeks.

The blood sugar figures on infection may have been higher as the patient did not take very much food on day prior to operation i.e., day of investigations.

Case No. 78. Housewife: age 45.

Diabetes for 3 years. Thin build but otherwise no abnormality noted. She developed a sore throat with slight toxaemia. She gave a history of being subject to sore throats.

Temperature: 99-102° for 3 days.

Throat: Vincents Organisms;

W.B.C.s. = 17,000 per c.mm. for 5 days.

Treatment: Chromic acid 5% locally.

Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	187 180 168 184	182	4	32 P.Z.I.
On Infection:	243 236 201 232	228	27	32 P.Z.I.
After Infection:	194 186 160 183	183	9	32 P.Z.I.
After 3 months:	187 184 164 190	181	4	32 P.Z.I.
After 6 months:	191 187 152 174	176	7	32 P.Z.I.

Case No. 78. (Contd.)

Time for E.S.R. to return to normal = 1 week.

Case No. 79. Male: age 19. Engineer.

Diabetes for 4 years. He developed a rash of hands and arms and this became pustular. There was no general upset.

Skin Rash: Staph. aureus.

Treatment: Penicillin 100,000 units 6 - hourly. Lotio Calamine locally.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	190 201 180 182	188	4	40 P.Z.I. & 30 Soluble a.m.
On Infection:	194 206 190 210	200	42	" " " "
After Infection:	187 201 200 224	203	9	" " " "
After 3 months:	193 205 184 196	195	5	" " " "
After 6 months:	186 191 174 178	182	7	" " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 80. Housewife: age 41.

Diabetes for 15 years. Slight signs of myocardial insufficiency; slight ankle oedema, dyspnoea, cardiac sounds soft. B.P.= $\frac{184}{104}$ Fundi showed diabetic retinitis. She developed a sore throat with attendant toxaemia. She was subject to tonsillitis.

Temperature: 99 - 101° for 3 days.

Throat: Haemolytic streptococci

W.B.C.s. = 20,000 per c.mm. for 5 days.

Treatment: Penicillin 100,000 units 6 - hourly)
Mandls Paint to throat T.I.D.) for 7 days.

Case No. 80. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	220 234 186 200	210	3	16 units P.Z.I.
On Infection:	294 276 232 251	263	27	" " "
After Infection:	256 241 208 221	232	6	" " "
After 3 months:	224 231 184 196	209	5	" " "
After 6 months:	234 228 192 202	214	7	" " "

Time for E.S.R. to fall to normal = 1 week.

Case No. 81. Housewife: age 63.

Diabetes for 6 months. Main complaint was of tinnitus, giddiness and headaches with slight dyspnoea all being associated with her hypertension. B.P. = $\frac{224}{136}$ She was markedly overweight. Also complained of dysuria and frequency of micturition of 3 weeks duration.

Urine: Pyuria. Staphylococcus albus.

Treatment: Pot. Citrat. and Sod. Bicarb. gr xxx aa T.I.D. for 2 weeks.

Sulphatriad gm 1 T.I.D. for 1 month.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	197 186 164 187	184	12	Nil.
After Infection:	200 174 168 173	179	4	Nil.
After 3 months:	182 176 159 171	172	7	Nil.

Time for E.S.R. to fall to normal = 1 month.

Case No. 82. Male: age 49. Roadman.

Diabetes for 5 years. He suffered from dyspepsia for several years, but no cause for this was noted apart from carious teeth. His brother had

Case No. 82. (Contd.)

diabetes.

Teeth: Lowers all carious with septic alveolar absorption.

Treatment: Dental extraction.

Penicillin 100,000 6 - hourly for 24 hours before and 36 hours after extractions.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	212 237 186 192	207	9	36 P.Z.I.
After Infection:	222 220 176 194	203	2	36 P.Z.I.
After 3 months:	200 206 192 196	199	8	36 P.Z.I.
After 6 months:	196 200 198 212	202	7	36 P.Z.I.

Case No. 83. Male: age 32: labourer.

Diabetes for 12 years. He had no complaints but developed a severe coryza or mild influenza.

No specific organism was isolated.

Temperature: 99 - 101° for 4 days.

Treatment: Aspirin s.o.s. for 4 days.

	Blood Sugars	Average	E.S.R.	Insulin
Before infection:	153: 160: 157: 155	156	4	32 P.Z.I & 16 Soluble A.M.
On infection:	197: 184: 182: 174	184	17	" " " "
After infection:	156: 153: 162: 148	155	9	" " " "
After 3 months:	165: 158: 155: 162	166	3	" " " "

Time for E.S.R. to fall to normal = 1 week.

Case No. 84. Female. age 13. Schoolgirl.

Diabetes for 2 months. She developed symptoms and signs of acute rheumatism, there was no residual cardiac involvement. She was subject to sore throats and this attack was preceded by a sore throat.

Throat: Haemolytic streptococci.

Blood Culture: Staphylococcus albus, probably contaminant.

Temperature: 99 - 102° for 5 days.

W.B.C.s. = 5,000 per c.mm. for 14 days.

Treatment: Aspirin gr x 4 - hourly for 18 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	216 194 200 183	198	64	20 Sol. a.m. & 12 Sol. p.m.
On Infection:	224 206 221 198	212	43	" " " " "
After Infection:	194 183 180 176	183	3	" " " " "
After 6 months:	152 148 160 153	203	8	" " " " "

Time for E.S.R. to fall to normal = 9 weeks.

The increase in the 6 - monthly blood sugar figures was thought to be due to an increase in the normal course of her diabetes. No septic focus was demonstrable at that time and no other cause for increase was noted.

Case No. 85. Female. age 16. Clerkess.

Diabetes for 3 years. She developed a left acute otitis media.

She had no previous illnesses and this infection began with a coryza.

Ear: Haemolytic streptococci.

Treatment: Penicillin 100,000 units 6 - hourly for 2 weeks.

Albucid ear drops.

Case No. 85 (Contd).

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection:	184: 186: 159: 163	173	5	16 P.Z.1.
On infection	184: 191: 156: 163	174	4	16 P.Z.1.
After infection:	179: 183: 162: 164	172	3	16 P.Z.1.
After 3 months	193: 192: 163: 175	181	7	16 P.Z.1.

Case No. 86. Housewife: age 59.

Diabetes for 13 years: She had been subject to dyspepsia and various abdominal pains but developed an acute cholecystitis. She was overweight. B.P. = 144/98 with moderate cardiac sounds.

Temperature: 98 - 102° for 5 days.

Gall Bladder: Acute cholecystitis. B. coli organism.

W.B.Cs. = 15,000 per c.mm. for 11 days.

Treatment: Penicillin 100,000 6 - hourly for 7 days.

Cholecystectomy.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection	234: 242: 211: 237	231	34	Nil
After infection	200: 194: 178: 212:	191	4	Nil
After 3 months	212: 190: 182: 197	193	8	Nil

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 87. Male: age 28. Painter.

Diabetes for 2 years. He developed a small septic spot on the face and this developed into erysipelas. He had otherwise always been healthy. His brother had diabetes.

Skin: Erysipelas - streptococcus.

Temperature: 99 - 102° for 5 days.

Case No. 87. (Contd.)

W.B.Cs. = 21.000 per c.mm. for 10 days.

Treatment: Penicillin 100,000 units 6 - hourly for 10 days.

Sulphatriad gm. $\dot{+}$ 4 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	198 210 180 184	193	5	48 P.Z.I.
On Infection:	214 236 198 203	213	39	" " "
After Infection:	200 211 184 191	195	5	" " "
After 3 months:	201 203 172 181	189	9	" " "

Patient did not report for further checks.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 88 Housewife. age 53.

Diabetes for 6 months. She was overweight and had suffered from bilateral varicose veins for many years, particularly the right.

Subject to coryza and winter cough but no evidence of this was found during period of observation. She sustained a knock on the R. shin and this developed into a purulent varicose ulcer.

Skin: Staphylococcus aureus.

W.B.C.s = 11,000 per c.mm. for 2 weeks.

Treatment: Rest, Elastoplast to leg. Penicillin powder locally for 4 weeks.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	184 193 176 192	186	29	Nil.
After Infection:	191 203 168 184	187	3	Nil.
After 3 months:	153 162 148 151	154	7	Nil.

Case No. 88 (contd.)

Patient did not report for further investigations.

Time for E.S.R. to fall to normal = 5 weeks.

Case No. 89. Housewife: age 63.

Diabetes for 3 months. Subject to chronic productive cough especially in the winter. Dyspnoea on exertion and on occasions had noted slight ankle oedema. Cardiac sounds were soft with occasional extra-systoles. B.P. = 174/94 Chest findings were those of chronic bronchitis. She developed signs and symptoms of broncho-pneumonia.

Temperature: 100 - 103° for 4 days.

Sputum: Pneumococci.

W.B.Cs. = 18,000 per c. mm. for 11 days.

Treatment: Sulphatriad gm. ⅄ 4 - hourly for 8 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	249: 273: 220: 254	249	35	Nil
After infection:	226: 234: 192: 204	214	4	Nil
After 3 months:	231: 228: 187: 199	211	5	Nil

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 90. Male: age 24. Plumber.

Diabetes for 3 months. He had always been healthy but sustained an injury to his R. hand and this had become septic with lymphangitis.

Wound: Staphylococcus albus,

Temperature: 99 - 101° for 3 days.

W.B.Cs. = 20,000 per c. mm. for 10 days.

Case No. 90 (contd.)

Treatment: Penicillin powder locally. Penicillin 100,000 units 6 - hourly for 10 days.

Then dry dressings.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection:	156: 178: 132: 124	148	16	20 P.Z.1 & 20 Soluble
After infect.	146: 152: 130: 116	138	4	" " "
After 3 mths.	151: 146: 128: 123	137	7	" " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 91. Female. age 47. Shop Assistant.

Diabetes for 9 years. She had no other symptoms, was of thin build and developed a sore throat with some toxaemia.

Throat: Vincents Organism.

Temperature: 98 - 102° for 4 days.

W.B.C. = 19,000 per c. mm. for 8 days.

Treatment: Penicillin 100,000 units 6 - hourly for 9 days.

Chromic acid 5 % locally and hydrogen peroxide gargles.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before infection:	190: 182: 163: 180	179	7	12 P.Z.1.
On Infection:	232; 214: 198: 221	216	43	12 P.Z.1.
After Infection:	200: 184: 173: 181	185	9	12 P.Z.1.
After 3 months:	184: 176: 163: 171	174	7	12 P.Z.1.
After 6 months:	193: 178: 165: 175	178	9	12 P.Z.1.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 92. Male. age 64. Miner.

Diabetes for 4 months. Complaint over the past few years, of increasing dyspnoea on exertion. Cardiac sounds of good quality but evident arteriosclerosis. He developed dry gangrene of the R. toes with some attendant inflammation. Pulses of legs and feet remained palpable.

No organism isolated.

Treatment: Penicillin 100,000 units 6 - hourly for 14 days.

Dry dressings to toes for 1 month.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	194 178 184 176	183	10	Nil.
After Infection:	183 188 173 181	181	7	Nil.
After 3 months:	192 183 174 183	183	5	Nil.

Case No. 93. Female. age 11. Schoolgirl.

Diabetes for 2 years. She developed a L. axillary furunculosis.

Temperature: 99 - 99.6° for 3 days.

Skin Boil: Staphylococcus aureus.

W.B.C.s. = 12,600 per c.mm. for 3 days.

Treatment: Dry heat locally.

Penicillin 100,000 units 6 - hourly for 2 weeks.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	190 184 174 168	177	7	24 Soluble a.m. & 16 Soluble p.m.
On Infection:	224 183 194 176	194	27	" " " "
After Infection:	196 173 170 164	176	4	" " " "
After 3 months:	184 172 181 163	175	5	" " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 94. Male. age 62. Printer.

Diabetes for 1 year. He had always been healthy but developed a carbuncle of the back of his neck. His mother had diabetes.

Skin Carbuncle: Staphylococcus aureus isolated.

Blood Culture: Staphylococcus aureus isolated.

Temperature: 99 - 101° for 5 days.

W.B.C.s. = 17,000 per c.mm. for 9 days.

Treatment: Penicillin 100,000 units 6 - hourly for 14 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	312 243 222 264	260	49	Nil.
After Infection:	226 204 183 196	202	3	Nil.
After 3 months:	203 194 176 187	190	5	Nil.
After 6 months:	212 200 173 192	194	7	Nil.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 95. Female. age 63. Housekeeper.

Diabetes for 7 years. Subject to dyspnoea, ankle oedema and dyspepsia. No cause other than the cardiac insufficiency was found for her dyspepsia. She was overweight, there was slight ankle oedema, cardiac sounds were soft with auricular fibrillation. B.P. = $\frac{174}{98}$ Main complaint was of vulvar dermatitis with small pustular rash of abdomen.

Skin Rash: Staphylococcus albus.

Treatment: Lotio Calamine c 2% Phenol T.I.D. for 3 weeks.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	254 237 192 234	229	9	Nil.
After Infection:	246 234 196 222	225	5	Nil.

Case No. 95. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
After 3 months:	248 231 197 215	223	7	Nil.

Case No. 96. Male. age 24. Bricklayer.

Diabetes for 5 months. He was subject to sore throats and developed one at this time. General toxaemia.

Throat: Haemolytic streptococci

Temperature: 100 - 103° for 4 days.

W.B.C.s. = 15,000 per c.mm. for 7 days.

Treatment. Penicillin 100,000 units 6 - hourly for 9 days.

Mandl 's Paint locally.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	200 194 186 170	194	8	20 Soluble a.m.& 16 Sol. p.m.
On Infection:	246 212 183 187	207	52	" " " " " " "
After Infection:	223 214 192 185	204	2	" " " " " " "
After 3 months:	202 184 176 164	182	9	" " " " " " "
After 6 months:	211 192 200 184	197	7	" " " " " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 97. Housewife. age 64.

Diabetes for 2 years. She was subject to occasional frontal headaches for which no cause was found. General health was good. No urinary symptoms.

Urine: Pyuria. B. coli.

Treatment: Pot. Citrate and Sod. Bicarb. gr xxx aa T.I.D. for 14 days.

Case No. 97. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	174 168 140 163	161	9	8 P.Z.I.
After Infection:	183 170 134 152	160	7	8 P.Z.I.
After 3 months:	176 182 143 161	166	8	8 P.Z.I.

Case No. 98. Housewife. age 65.

Diabetes for 1 year. Subject to nasal catarrh with post-nasal catarrh and cough, giving purulent sputum. Dyspnoeic on exertion. Chest findings were those of chronic bronchitis and emphysema, cardiac sounds were of moderate quality. B.P. = $\frac{174}{102}$ A cousin had diabetes.

Sputum: Pneumococcus.

W.B.C.s. = 13,000 per c.mm.

Treatment: Penicillin: aerosol therapy.

Penicillin 100,000 units 6 - hourly for 21 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	202 194 184 193	193	23	Nil.
After Infection:	194 192 174 183	186	6	Nil.
After 3 months:	193 184 173 191	185	4	Nil.

Time for E.S.R. to fall to normal = 3 weeks.

Infective element appeared to have cleared although chronic bronchitic findings remained.

Case No. 99. Male. age 13. Schoolboy.

Diabetes for 1 year. No abnormality was noted on initial examination but he developed impetigo of the face.

Case No. 99. (Contd.)

Skin: Streptococcus.

Treatment: Ung. Hydrarg. Nit Dil. B.D. for 7 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	184 183 152 157	169	4	30 Soluble a.m.& 20 Sol. p.m.
On Infection:	194 173 156 159	166	9	" " " " " "
After Infection:	186 175 148 163	168	7	" " " " " "
After 3 months:	192 181 151 159	171	7	" " " " " "

Case No. 100. Female. age 19. Factory worker.

Diabetes for 7 months, She had cystitis when at school and now complained of recurrence of symptoms of dysuria and urinary frequency.

Urine: Pyuria. Staphylococcus albus.

Treatment: Sulphatriad gm 1 T.I.D. for 14 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	168 179 137 159	161	7	24 P.Z.I.
On Infection:	193 184 143 165	171	9	24 P.Z.I.
After Infection:	186 184 139 168	169	3	24 P.Z.I.
After 3 months:	164 179 143 163	162	5	" " " "

Case No. 101. Male. age 57. Engineer.

Diabetes for 6 years. He had enjoyed good health but developed a crop of boils of the buttocks.

Skin Boils: Staphylococcus aurens.

W.B.C.s. = 14,000 per c.mm.

Case No. 101. (Contd.)

Treatment: Penicillin 100,000 units 6 - hourly for 9 days.

	Blood Sugars.	Average.	E.S.R.	Insulin.
Before Infection:	206 183 174 191	189	6	48 P.Z.I.
On Infection:	231 247 213 234	231	29	" " "
After Infection:	215 198 172 194	195	7	" " "
After 3 months:	202 187 181 194	191	11	" " "
After 6 months:	211 183 172 188	189	5	" " "

Time for E.S.R to fall to normal = 2 weeks.

Case No. 102. Housewife. Age. 49.

Diabetes for 2 months. She was of average build and apart from occasional attacks of 'flu' she had no illnesses until she developed rheumatoid arthritis of the hands. This had been present for 4 months.

Hands: Rheumatoid arthritis.

Treatment: Myocrisin. 2 courses of 1 gm. each course.

General measures.

	Blood Sugars.	Average.	E.S.R.	Insulin.
On Infection:	194 183 164 182	181	54	Nil.
After Infection:	193 184 152 163	173	3	Nil.
After 3 months:	191 184 153 164	173	1	Nil.
After 6 months:	183 177 157 174	173	9	Nil.

Time for E.S.R. to fall to normal = 4 months.

Case No. 103. Male. age 19. Draughtsman.

Diabetes for 5 years. Developed a sore throat with general toxaemia.

Throat: Haemolytic streptococci.

Case No. 103. (contd.)

Temperature: 100 - 103° for 4 days.

W.B.C. = 18,000 per c.mm. for 11 days.

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection:	234: 246: 198: 226:	225	31	20 soluble at 7.30 A.M. Noon and 5.30 P.M.
After infection:	223: 224: 210: 236:	223	7	" " " " "
After 3 mths.	198: 184: 183: 197:	191	8	" " " " "
After 6 mths.	183: 192: 175: 187:	186	9	" " " " "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 104. Female: age 62: Cleaner.

Diabetes for 4 years: She complained of dyspnoea, ankle oedema, headaches and giddiness. Cardiac sounds were of average quality. B.P. = 214/126. Fundi showed silver wiring of the arteries. She developed an acute bronchitis following coryza; purulent sputum noted.

Temperature: 100 - 101° for 3 days.

Sputum: Pneumococci.

W.B.C. = 13,000 per c.mm.

Treatment: Warm alkaline mixture. Penicillin 100,000 units 6 - hourly for 8 days.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection:	184: 193: 164: 182	181	17	Nil
After infect.	164: 172: 143: 164	161	8	Nil
After 3 mths.	171: 164: 140: 158	158	3	Nil

Time for E.S.R. to fall to normal = 3 weeks.

There was a slight improvement in hypertension and cardiac condition

Case No. 104 (contd.)

and this may have accounted for some of the improvement in blood sugars.

Case No. 105. Female: age 61: Cook.

Diabetes for 2 months. She developeda whitlow of R. thumb with some lymphangitis and lymphadenitis.

Skin: Abscess :- Staphylococcus aureus.

W.B.C. = 12,000 per c. mm. for 7 days.

Treatment: Incision and Penicillin powder 100,000 units 6 hourly for 8 days.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection:	232: 212: 194: 203	210	19	12 P.Z.I.
After infect.	204: 206: 183: 189	196	3	12 P.Z.I.
After 3 mths.	211: 203: 178: 200	198	7	12 P.Z.I.

Time for E.S.R. to fall to normal = 7 days.

Case No. 106. Male. age 74. retired miner.

Diabetes for 8 years. Dyspnoea on exertion, subject to dry cough and frequency of micturition. He was arterio sclerotic; the vessel walls were very hard and fundi showed silver wiring of arteries and diabetic retinitis. He developed dysuria. 2 brothers had diabetes.

Urine: Pyuria. B. coli.

Treatment: Pot. Citrate and Sod. Bi-carb gr. xxx aa T.I.D. for 14 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	203: 198: 174: 193	192	9	Nil
After infect.	198: 193: 169: 187	187	5	Nil
After 3 mths.	204: 200: 182: 202	197	7	Nil

Cardiac and Hypertensive symptoms showed a slight improvement but this has had no influence on the blood sugar figures.

Case No. 107. Housewife. age 62.

Diabetes for 2 years: She was subject to rheumatics, in reality osteo-arthritis affecting mainly the hips. Cardiac sounds were soft. B.P. = 176/102. There was auricular fibrillation.

Urine: Pyuria. B. coli. Symptomless.

Treatment: Pot. Citrate and Sod. Biccarb. gr. xxx aa T.I.D. for 12 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	157: 164: 138: 149	152	15	Nil
After infect.	149: 148: 129: 137	141	4	Nil
After 3 mths.	158: 147: 132: 141	145	9	Nil
After 6 mths.	161: 143: 128: 140	143	7	Nil

Time for E.S.R. to fall to normal = 1 week.

Case No. 108. Male: age 17: Printer.

Diabetes for 4 months. He had acute rheumatism in childhood but there had been no cardiac involvement. He developed multiple boils.

Temperature: 99.6° for 4 days. W.B.C. = 13,600 per c. mm.

Boils: Staphylococcus aureus.

Treatment: Penicillin 100,000 units 6 - hourly for 12 days.

	Blood Sugars.	Average	E.S.R.	Insulin
On infection:	198: 176: 163: 179	179	29	28 P.Z.I.
After "	172: 164: 140: 153	157	4	" "
after 3 mths.	181: 174: 142: 151	162	7	" "

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 109. Housewife: age 61.

Diabetes for 3 months. She was otherwise well but developed an impetigo of hands and face of severe degree.

Skin: Streptococcus.

W.B.C. 14,000 per c. mm.

Treatment: Penicillin cream locally B.D. for 12 days.

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection:	173: 104: 152: 160	147	4	Nil
On infection:	168: 171: 147: 152	160	19	Nil
After infection:	183: 174: 140: 164	165	7	Nil
After 3 months:	171: 163: 144: 171	162	9	Nil

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 110. Male: age 25: Bricklayer.

Diabetes for 5 years; He had acute rheumatism in childhood and mitral stenosis was noted. He developed a fever and ultimately sub-acute bacterial endocarditis was diagnosed.

Throat Swab: Streptococcus Viridans.

Blood Culture: " "

Temperature: 98 - 101° for 12 days.

W.B.C: 17,000 per c. mm. for 14 days.

Treatment: Penicillin 200,000 units 6 - hourly for 28 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	274: 242: 223: 246:	246	83	28 P.Z.I.
After infect.	254: 200: 184: 193	208	2	" "
After 3 mths.	246: 212: 174: 191	206	7	" "
After 6 mths.	231: 204: 183: 202	205	9	" "

Case No. 110 (contd.)

Time for E.S.R. to fall to normal = 28 days.

Case No. 111 Male: age 74: Retired banker.

Diabetes for 2 years: He developed a dermatitis of the arms and this became septic with scratching

Skin: Staphylococcus albus.

Treatment: Starch poultice followed by Penicillin cream, and finally cremor zinci. 1 month 's treatment.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	183: 174: 153: 192	176	8	Nil
After infect.	191: 176: 160: 184	178	3	Nil
After 3 mths.	183: 169: 162: 176	173	7	Nil

Case No. 112. Housewife. age 68.

Diabetes for 3 months. Only abnormality noted was markedly carious teeth.

Teeth. Carious. No organism was isolated from root abscesses of $\underline{4}|$ and $|\overline{6}$.

Treatment: Dental extraction. Penicillin 100,000 units 6-hourly for 24 hours before and 48 after.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	184: 173: 157: 161	169	19	Nil
After infect.	176: 170: 149: 167	166	3	Nil
After 3 mths.	164: 178: 153: 159	164	7	Nil

Time for E.S.R. to fall to normal = 1 week.

Case No. 113. Housewife: age 69.

Diabetes for 3 years. For several years, subject to dyspepsia of gall-bladder type. Attack of acute cholecystitis developed. Patient was overweight, cardiac sounds were soft and occasional extra-systoles were noted. There was slight congestion at lung bases.

Temperature: 99 - 101° for 3 days.

Gall-bladder: B. coli isolated.

W.B.C. = 18,000 per c. mm. for 7 days.

Treatment: Penicillin 100,000 units 6 - hourly for 6 days. Cholecystectomy.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	212: 198: 184: 234	207	27	Nil
After infect.	221: 184: 183: 210	197	2	Nil
After 3 mths.	204: 172: 171: 186	183	5	Nil
After 6 mths.	210: 198: 175: 187	193	7	Nil

Time for E.S.R. to return to normal = 3 weeks.

Case No. 114. Male: age 31. fitter.

Diabetes for 10 years. No complaints recently until onset of severe tonsillitis while under observation.

Throat: Haemolytic streptococci.

Temperature: 98 - 101° for 4 days.

W.B.C. = 18,000 per c. mm. for 7 days.

Treatment: Penicillin 100,000 units 6 - hourly for 8 days.

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection	218: 203: 190: 204	204	4	36 P.Z.1.
On infection:	314: 279: 232: 261	272	43	36 P.Z.1.

Case No. 114 (contd.)

	Blood Sugars.	Average	E.S.R.	Insulin
After infection:	236: 200: 192: 214	210	3	36 P.Z.1.
After 3 months:	224: 202: 187: 209	206	7	36 P.Z.1.
After 6 months:	215: 210: 192: 204	205	5	36 P.Z.1.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 115. Male: age 13: schoolboy.

Diabetes for 18 months. He had been subject to coryza every winter and developed it as usual on this occasion. No other symptoms other than coryza.

Temperature: 99.6° on several days in first week.

Nasal Swab: Staphylococcus albus.

Treatment: Menthol inhalations. B.D. for 1 week.

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection:	184: 169: 157: 167	169	8	24 Soluble A.M. & 16 Soluble P.M.
On infection	192: 174: 163: 182	178	7	" " " "
After infection:	183: 176: 159: 176	174	5	" " " "
After 3 mths.	191: 167: 153: 169	170	7	" " " "

Case No. 116. Housewife: age 74.

Diabetes for 3 months. She had developed septic spots on the L. forearm but otherwise had always been in good health.

Skin: Staphylococcus aureus isolated.

Treatment: Penicillin 100,000 units 6 - hourly for 9 days.

Case No. 116 (contd.)

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	164: 182: 151: 169	167	23	Nil
After infect.	159: 163: 131: 143	149	4	Nil
After 3 mths.	146: 168: 137: 150	150	7	Nil

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 117 Male. age 54; gardener.

Diabetes for 4 years. He had a confirmed duodenal ulcer for 20 years but this was not causing any severe symptoms. He developed acute appendicitis.

Appendix: B. coli.

Temperature: 100 - 102° for 3 days.

W.B.C. = 18,000 per c. mm. for 5 days.

Treatment: Appendicectomy.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	216: 231: 186: 204	209	32	Nil
After infect.	194: 197: 174: 193	190	7	Nil
After 3 mths.	184: 176: 154: 163	169	9	Nil
After 6 mths.	192: 183: 150: 158	171	3	Nil

Time for E.S.R. to fall to normal = 3 weeks.

Case No. 118: Female: age 23: Factory worker.

Diabetes for 2 years. Now developed frequency of micturition and dysuria; nausea and headache.

Temperature: 99 - 103° for 5 days.

W.B.C. = 14,000 per c. mm. for 10 days.

Case No. 118 (contd.)

Urine: Pyuria: B. coli.

Treatment: Sulphatriad gm. ŧ. 4-hourly for 6 days and then gm. ŧ. T.I.D. for 10 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	231: 204: 192: 231	215	42	28 P.Z.I.
After infect.	226: 200: 182: 201	202	9	28 P.Z.I.
After 3 mths.	201: 184: 176: 183	186	2	28 P.Z.I.
After 6 mths.	207: 192: 173: 189	190	5	28 P.Z.I.

Time for E.S.R. to fall to normal = 2 weeks.

Case No. 119. Male: age 17 : Miner.

Diabetes for 6 months. At work he sustained a laceration to his leg and this became septic. Inguinal adenitis present. He was previously under observation.

Wound: Staphy lococcus aureus.

Treatment: Penicillin powder locally. Penicillin 100,000 units 6 - hourly for 2 weeks.

	Blood Sugars.	Average	E.S.R.	Insulin
Before infection:	183: 190: 162: 180	179	7	20 P.Z.I & 8 soluble A.M.
On infection:	194: 198: 164: 171	182	22	" " " "
After infection:	184: 193: 167: 182	182	5	" " " "
After 3 months:	191: 182: 159: 176	177	9	" " " "

Time for E.S.R. to return to normal = 2 weeks.

Case No. 120. Housewife; age 65.

Diabetes for 1 year: She was overweight but otherwise no abnormality noted. She was subject to fibrositis.

Urine: Pyuria: Staphylococcus albus.

Treatment: Pot. Citrate and Sod. Bi-carb. gr. xxx aa T.I.D for 10 days.

	Blood Sugars	Average	E.S.R.	Insulin
On infection:	184: 176: 153: 172	171	9	Nil
After infect.	172: 181: 150: 166	167	7	Nil
After 3 mths.	177: 187: 149: 163	169	5	Nil

Case No. 121. Housewife. age 55.

Admitted with fractured L. tibia and fibula. While in wards typical symptoms and signs of acute rheumatism affecting knees, elbows and wrists. She later developed a R. otitis externa. The only previous illnesses she had had were winter colds. Haemoglobin = 10·5 gms.

Temperature: 99 - 100° at beginning of acute rheumatism for 14 days.

W.B.C.s. = 14,000 per c.mm. for 2 weeks.

Ear Swab: Staphylococcus aureus.

Teeth: 8| crown caries present.

Treatment: Aspirin gr x 4 - hourly for 23 days.

Penicillin 100,000 6 - hourly for 12 days (last days of Aspirin)

Tooth extracted.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
On acute rheumatism:	110	146	175	160	120	142	50	
On otitis externa:	110	152	160	160	134	143	14	
After Infection:	88	117	129	145	121	120	8	— 3 weeks
After tooth extraction:	102	124	127	121	113	117	9	
After 3 months:	108	142	125	114	106	119	5	

Case No. 122. Housewife. age 50.

3 weeks previously, sore throat and that was followed in 2 weeks by flitting joint pains and a picture of acute rheumatism; erythematous patches on the skin were present and she had a 2nd degree burn of the L. leg.

B.P. = $\frac{200}{110}$

Temperature: 101° for 3 days. Then 99 - 100° for 3 weeks.

W.B.C.s. = 14,000 per c.mm. for 10 days.

Case No. 122. (Contd.)

Throat: Vincent's organisms. Haemolytic streptococci.

Treatment: Sod. Salicyl and Sod. Bicarb. gr xxx aa T.I.D. for 26 days

Chromic acid and H_2O_2 to throat for 7 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	124 180 192 180 160	167	100	
After Infection:	138 170 200 200 170	178	3 —	3 weeks
After 3 months:	104 171 137 123 104	134	4	
After 6 months:	108 169 148 128 103	131	5	

Case No. 123. Housewife. age 34.

1 weeks history of flitting joint pains following a sore throat. Joints affected were those of hands in addition to the large joints. Cardiac area was enlarged and there was a soft systolic murmur at the apex. She had a similar history 8 months previously.

Temperature: 101 - 103° for 6 days.

Throat: Haemolytic streptococci.

Blood Culture: B. coli isolated. ? contaminant.

W.B.C.s. = 13,000 for 2 weeks.

Treatment: Sod. Salicyl and Sod. Bicarb. gr xxx aa 4 - hourly for 25 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	120 164 178 170 134	153	100	
After Infection:	120 170 174 174 142	156	3 —	4 weeks
After 3 months:	104 123 160 142 128	131	9	
After 6 months	106 135 143 124 102	121	5	

Case No. 124. Housewife. age 20.

8 months history of rheumatoid arthritis beginning in the wrists and spreading now to arms and leg joints. Diagnosis was confirmed radiologically. Haemoglobin = 11·5 gms.

Treatment: High calorie diet, iron and Vitamins.

Aspirin Guaiacol Carbonate for 21 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	96 130 172 124 104	125	20	
After Infection:	90 112 140 118 96	111	9	— 3 weeks
After 3 months:	94 124 136 104 95	111	7	

Case No. 125. Male. age 35. Process worker.

Admitted to another hospital as ? Meningitis but finally diagnosed as acute rheumatism. When seen he was afebrile but stiffness and limitation of abduction of L. shoulder were present. He was pale and thin. He had acute rheumatism in 1927 and 4 mastoid operations, last being in 1942. He developed a sore throat - slight toxaemia.

Throat: Haemolytic streptococci.

Temperature: 99 - 101° on few occasions in first 4 days.

W.B.C.s. = 17,000 per c.mm. for 7 days.

Treatment: Physiotherapy to shoulders. Penicillin 100,000 units 6 hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	92 121 136 100 94	109	4	
On Infection:	85 117 141 116 96	111	20	
After Infection:	92 124 145 108 97	113	8	— 1 week

Case No. 125. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Return to normal.
After 3 months	93 119 134 101 90	107	9	

Case No. 126. Male. age 28. Unemployed.

2 weeks history of abdominal pain, malaise, anorexia and coughing giving a blackish sputum. A right pleural effusion was found.

Temperature: 99 - 102° for 2 weeks. Effusion gone in 3 weeks.

W.B.C.s. = 14,000 per c.mm. for 2 weeks.

Treatment: As for tuberculosis. No organism from sputum.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	106 131 141 130 109	123	38	
After effusion gone:	103 114 126 119 104	113	2	— 3 weeks
After 6 months:	98 124 122 103 92	108	5	

At 6 months chest was clear clinically and there was no evidence of a tuberculous focus radiologically.

Case No. 127. Housewife. age 53

15 years history of rheumatoid arthritis of hands, wrists, feet and ankles. There was a few month's history of palpitations and dyspnoea. There were occasional extra-systoles, cardiac sounds were soft. B.P. = ~~150~~/90 She developed a sore throat.

Sinuses. Minimal catarrhal thickening.

Joints: Rheumatoid arthritis (inactive)

Throat: Haemolytic streptococci

Temperature: 99-101° for 3 days. W.B.C.s. = 14,000 per c.mm. for 5 days.

Case No. 127. (Contd.)

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Saline & 2% Ephedrine nasal drops for 14 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	94 132 126 108 100	112	7	
On Infection:	98 170 190 174 163	159	27	
After Infection:	92 130 162 148 110	128	7	2 weeks
After 3 months:	98 126 135 121 100	116	9	
After 6 months:	100 131 126 102 96	111	6	

There was no clinical or radiological evidence of a flare-up of the rheumatoid arthritis during investigations, but this possibility cannot be completely dismissed.

Case No. 128. Housewife. age 54.

26 years history of chronic cough giving rise to copious sputum and with periodic exacerbation of symptoms. She was in one of these on admission. She was pale and thin; bronchiectasis was detected at the L. lung base with a few inflammatory changes elsewhere.

During observation she developed frequency of micturition and dysuria.

Chest: As above. Sputum: pneumococci isolated.

W.B.C.s. = 12,000 per c.mm.

Treatment: Warm alkaline mixture T.I.D. for 2 months.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Chest Infection:	110 124 174 164 128	140	19	
After Infection:	90 100 166 146 102	121	9	2 months
After 3 months:	96 124 114 102 94	106	7	

Case No. 128. (Contd.)

Urine: Pyuria. B. coli isolated.

Treatment: Sulphatriad gm. 1 T.I.D. for 21 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Urinary Infection:	112 144 172 164 135	141	22	
After Urinary Infection:	94 134 159 134 102	125	3	— 3 weeks.
After 3 months:	92 131 124 100 96	109	3	

It was assumed that the blood sugars would have fallen to their lowest 3 months after chest infection, but this may not have been so.

Case No. 129. Housewife. age 71.

2 years history of dyspnoea, pulse was irregular, cardiac sounds were poor and E.C.G. showed sino-auricular block. Fundi showed silver wiring of the arteries. She had digestive symptoms, but these considered due to myocardial state. No urinary symptoms.

Urine: Pyuria. Staphylococcus albus.

Treatment: Sulphatridd gm. 1 T.I.D. for 7 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	85 120 140 106 90	108	2	
After Infection:	88 120 135 112 92	109	7	
After 3 months:	91 124 131 100 94	108	5	

Myocardial symptoms showed a very slight improvement.

Case No. 130. Male. age 31. Dairyman.

15 weeks history of pain in the R. leg and a true sciatica was diagnosed. He developed a sore throat with general toxaemia.

Case No. 130. (Contd.)

Temperature: 100 - 102° for 3 days.

W.B.C.s. = 18,000 per c.mm. for 7 days.

Throat: Haemolytic streptococci.

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

Physiotherapy to leg.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	94 124 139 120 98	115	4	
On Infection:	141 200 205 240 150	187	16	
After Infection:	100 135 163 169 154	140	9 —	1 week
After 3 months:	98 119 143 122 100	116	7	

Case No. 131. Male. age 48. Labourer.

5 weeks history of carbuncle of neck. There was also a week's history of dysuria and nausea. He was found to have chronic nephritis.

Skin Carbuncle: Staphylococcus aureus.

W.B.C.s. = 14,000 per c.mm. for 10 days.

Treatment: Penicillin 100,000 units 6 - hourly for 20 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	88 116 142 132 138	123	52 —	3 weeks
After Infection:	85 100 140 90 85	100	5	
After 3 months:	92 112 132 90 92	104	5	

The nephritic condition may have been lit up and accounted for some of the raised E.S.R.

Case No. 132. Housewife. age 58

Severe right hypochondriac pain for 2 weeks, of gall-bladder nature.

Case No. 132. (Contd.)

Cholecystogram did not demonstrate a gall-bladder. She was considered slightly myxoedematous, was overweight, cardiac sounds were poor and B.P. = $\frac{200}{120}$.

Throat: Haemolytic streptococci; symptomless.

Treatment: Sulphatriad gm. 1. T.I.D. for 12 days.

Penicillin lozenges 1 - 4 hourly for 4 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	109 120 165 141 111	129	29	
On Infection:	120 135 170 160 150	147	34	
After Infection:	84 120 144 106 100	111	7	— 2 weeks
After 3 months:	92 131 136 102 95	111	8	

Case No. 133. Male. age 21. Lorry driver.

Previous history of chronic nephritis and he was under observation for an exacerbation of this complaint. He developed tonsillitis to which he was subject. He was also subject to frequent coryzal attacks and winter cough.

Throat: Vincent's Organism.

Temperature: 99 - 100° for 4 days.

Treatment: Chromic acid 5% and $H_2 O_2$ gargles for 6 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	100 124 134 108 98	113	4	
On Infection:	84 116 130 154 122	121	36	
After Infection:	88 144 133 126 92	117	3	— 1 week
After 3 months:	92 131 134 104 96	111	8	

His previous coryza may have had an effect on his carbohydrate tolerance and consequently there may have been a greater increase in the blood sugar

Case No. 133. (Contd.)

than is apparent.

Case No. 134. Male. age 15. Apprentice Engineer.

He developed a cough 5 weeks before admission followed by anorexia, fever, and three days history of oedema of ankles and ascites. He had a L. pleural effusion, pericardial effusion, and ascites. Diagnosed as tuberculous poly-serositis and confirmed bacteriologically.

W.B.C.s. = 16,000 per c.mm. for 4 weeks.

Treatment: Sanatorium regime for 2 months.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	110 146 178 164 130	152	18	
After Improvement:	79 122 129 146 109	117	9 —	2 months
After further Improvement	84 126 131 104 91	107	7	

Patient transferred to Sanatorium and then for pericardectomy. No further observations were made.

Case No. 135. Housewife. age 64.

In hospital for treatment of myocardial failure symptoms. Auricular fibrillation present. B.P. = $\frac{154}{92}$ She had rheumatic fever in childhood and had always had a 'weak heart'.

Urine: Pyuria. Staphylococcus albus. Symptomless.

Treatment: Pot. Citrate. and Sod. Bicarb. gr. xxx aa T.I.D. for 10 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	94 134 147 124 98	119	9	

Case No. 135. (Contd.)

	Blood Sugars.					Average.	E.S.R.
After Infection:	100	126	144	112	98	116	5
After 3 months:	92	124	136	104	93	110	7
After 6 months:	101	118	142	110	102	115	9

Case No. 136. Housewife. age 69.

Main complaint was of headaches and giddiness. She was hypertensive. B.P. = $\frac{204}{120}$ cardiac sounds were good; fundi showed silver wiring. While in hospital she developed tonsillitis - slight toxaemia.

Throat: Haemolytic streptococci.

Temperature: 99 - 102° for 4 days.

W.B.C.s. = 21,000 per c.mm. for 5 days.

Treatment: Penicillin 100,000 units 6 - hourly for 3 days.

Penicillin lozenges for 9 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infection:	103	134	132	104	99	114	7	
On Infection:	122	156	172	164	143	151	32	
After Infection:	104	144	152	124	112	127	8	1 week
After 3 months:	102	132	153	121	100	122	4	
After 6 months:	94	121	134	96	98	109	9	

Case No. 137. Female. age 13. Schoolgirl.

Admitted with typical acute rheumatism; the symptoms following a sore throat 10 days previously. A systolic murmur was audible at the mitral area.

No organism isolated.

Case No. 137. (Contd.)

Temperature: 99 - 102° for 5 days.

W.B.C.s. = 18,000 per c.mm. for 10 days.

Treatment: Sod. Salicyl and Sod. Bicarb. gr. xx aa 6 - hourly for 3 weeks.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	118 154 193 174 163	180	54	
After Infection:	100 121 143 112 98	115	8 —	8 weeks
After 3 months:	98 119 136 116 100	114	7	

Case No. 138. Housewife. age 63.

Health had always been good apart from occasional coryza. She developed a severe coryza when she was in hospital where she was receiving treatment for hypochromic anaemia. Blood picture by this time had reached normal limits.

Nasal Swab: Staphylococcus aureus.

Temperature: 99 - 99·6° for 2 days.

Treatment: Aspirin S.O.S.

	Blood Sugars.	Average.	E.S.R.
Before Infection:	102 146 138 124 104	125	9
On Infection:	104 154 144 132 104	128	8
After Infection:	98 146 159 122 103	126	4
After 3 months:	101 150 156 121 98	125	7

Case No. 139. Housewife. age 56.

In hospital for investigation of dyspepsia but no cause for this was noted. She developed frequency of micturition and dysuria. She had always complained of nocturia.

Case No. 139 (contd.)

Urine: Pyuria. B. coli.

Treatment: Sulphatriad gm I T.I.D. for 14 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
Before infection:	102: 128: 139: 108: 102:	115	4	
On infection:	115: 162: 154: 121: 108	132	17	
After infection:	98: 143: 149: 104: 96	118	3	2 weeks
After 3 months:	99: 132: 129: 106: 102	114	7	

Case No. 140. Female: age 39 Factory Worker.

Stuck needle into thumb and this became septic with lymphangitis and lymphadenitis. General malaise.

Skin: Staphylococcus aureus. W.B.Cs. = 13,000 per c. mm for 1 week.

Treatment: Incision and Penicillin 100,000 units 6 - hourly for 9 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	114: 172: 185: 156: 153	156	23	
After "	108: 164: 153: 132: 124	136	9	1 week
After 3 mths.	104: 144: 152: 121: 101	124	9	
After 6 mths.	102: 139: 149: 112: 98	120	8	

Case No. 141 Male: age 14; Schoolboy.

Acute rheumatism, symptoms being present for 5 days. He had never been very strong and had contracted most childhood complaints by this time. Elbows and knees were mainly involved. No organism isolated.

Temperature: 100-103° for 5 days. W.B.Cs. - 13,000 per c.mm. for 2 weeks.

Treatment: Aspirin gr. x 6 - hourly for 3 weeks.

Case No. 141 (contd.)

	Blood Sugars	Average	E.S.R.	Return to Normal
On infection:	116: 144: 156: 134: 136	137	59	
After infect.	109: 153: 142: 121: 116	128	2	- 6 weeks.
After 3 mths.	104: 132: 146: 118: 100	120	4	
After 6 mths.	98: 126: 139: 112: 102	115	7	

Case No. 142 Female: age 11: Schoolgirl.

She had been subject to boils. She now developed a crop on her back.

Boils: Staphylococcus aureus.

Temperature: Occasional 99.6° W.B.Cs. 14,000 per c. mm. for 7 days.

Treatment: Penicillin 100,000 units 6 - hourly.

	Blood Sugars.	Average	E.S.R.
On infection:	116: 153: 142: 112: 108	126	7
After infect.	108: 149: 137: 108: 110	122	5
After 3 mths.	99: 151: 156: 100: 96	120	7

Case No. 143. Housewife: age 64.

Gall-bladder symptoms for many years. At this time she developed an acute cholecystitis. In addition she was overweight, there was slight ankle oedema and a few râles at lung bases.

B.P. = 148/88 Cardiac sounds were indistinct.

Gall-bladder No organism obtained.

Temperature: 100 - 102° for 3 days: W.B.Cs. = 18,000 per c. mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 10 days.

Case No. 143 (contd.)

	Blood Sugars.					Average	E.S.R.	Return to Normal
On infection:	115:	142:	134:	110:	112	123	29	
After infect.	104:	136:	132:	104:	98	115	4	2 weeks.
After 3 mths.	94:	143:	136:	100:	96	114	9	
After 6 mths.	102:	136:	144:	112:	100	119	4	

Case No. 144. Male: age 21: Shipyard Worker.

Acute appendicitis, symptoms being present for 24 hours. He had been subject to vague abdominal pains at intervals for many years. Previous health had been good.

Appendix: B. coli isolated.

Temperature: 100 - 102° for 36 hours; W.B.Cs. = 16,000 per c. mm for 1 week.

Treatment: Appendicectomy.

	Blood Sugars.					Average	E.S.R.	Return to Normal
On infection:	124:	156:	174:	143:	148	149	39	
After infect.	114:	156:	143:	112:	104	126	4	3 weeks.
After 3 mths.	102:	136:	134:	108:	99	116	7	
After 6 mths.	99:	123:	143:	104:	98	113	9	

Case No. 145. Housewife: age 63.

Digestive symptoms for many years; a duodenal ulcer was diagnosed 10 years ago and she had an exacerbation of her symptoms at this time. She developed an acute tonsillitis;

Throat: Haemolytic streptococci.

Treatment Temperature: 99 - 101° for 3 days; W.B.Cs = 20,000 per c. mm for 1 week.

Case No. 145 (contd.)

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars					Average	E.S.R.	Return to Normal
Before infection:	102:	134:	130:	108:	100	115	4	
On infection:	126:	148:	176:	136:	159	145	56	
After infection:	112:	132:	143:	122:	125	135	4	2 weeks.
After 3 mths.	98:	124:	132:	104:	102	112	6	

Case No. 146. Male: age 46: turner.

He sustained an injury to his scalp at his work. This had been stitched but became septic with much surrounding oedema.

Wound: Staphylococcus aureus.

Temperature: 99 - 100° for 4 days; W.B.Cs. 12,000 per c. mm. for 1 week.

Treatment: Penicillin powder locally. Penicillin 100,000 units 6 - hourly for 9 days.

	Blood Sugars.					Average	E.S.R.
On infection:	104:	126:	134:	118:	100	116	8
After infect.	100:	132:	141:	102:	98	117	9
After 3 mths.	98:	124:	146:	112:	100	116	4
After 6 mths.	101:	132:	143:	108:	104	118	8

Case No. 147. Housewife: age 59.

Symptoms and signs of myocardial degeneration; ankle oedema, slight cyanosis , liver palpable, cardiac sounds of poor quality B.P = 156/92. She had been subject to this complaint for many years.

Throat: Haemolytic streptococci; Symptomless.

Case No. 147 (contd.)

Treatment: Penicillin lozenges 1 - 4 hourly for 4 days.

	Blood Sugars.	Average	E.S.R.
On infection:	103: 144: 149: 121: 98	123	8
After infect.	102: 136: 146: 112: 104	120	7
After 3 mths.	107: 143: 131: 112: 110	121	5

Case No. 148. Female: age 21.

Previous health had always been good but developed acute tonsillitis. She had been subject to this complaint on several occasions. Severe toxaemia.

Throat: Haemolytic streptococci.

Temperature: 100 - 103° for 3 days. W.B.Cs. = 21,000 per c. mm. for 10 days.

Treatment: Sulphatriad gm. II 4 - hourly for 5 days.

Mandl's Paint locally.

	Blood Sugars.	Average	E.S.R.	Return to Normal
Before infection:	99: 129: 143: 134: 103	122	7	
On infection:	134: 156: 183: 164: 154	158	42	
After infect.	119: 143: 164: 138: 129	139	4	2 weeks.
After 3 mths.	101: 134: 142: 121: 98	119	3	

Case No. 149. Housewife: age 57.

Pernicious anaemia for 5 years and on this occasion evidence of subacute combined degeneration of the cord was noted. Blood picture was brought up to normal by liver therapy. She also complained of dyspepsia even after HCl. had been added and it was thought due to carious teeth.

Case No. 149 (contd.)

Teeth: Carious. Alveolar absorption with rupt abscess at $\overline{6}$ Staphylococcus albus isolated from root.

W.B.Cs. = 12,000 per c. mm. for 5 days.

Treatment: Extraction of teeth.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	114: 143: 154: 121: 108	128	19	
After infect.	107: 136: 143: 124: 110	124	4	3 weeks.
After 3 mths.	98: 132: 139: 112: 104	117	7	
After 6 mths.	100: 126: 135: 108: 102	114	6	

Case No. 150. Male: age 14: Schoolboy.

He developed impetigo of his face. He had measles, whooping cough and chickenpox in early schooldays.

Skin: Streptococcus.

Treatment: Penicillin cream B.D for 10 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	104: 136: 159: 144: 121	133	14	
After infect.	103: 124: 134: 112: 112	117	4	3 weeks.
After 3 mths.	100: 126: 139: 108: 98	114	7	
After 6 mths.	98: 132: 141: 102: 103	115	5	

Case No. 151. Female: age 20: Physiotherapist.

Sudden onset of acute tonsillitis and was first seen on the day after symptoms began. Pale appearance and thin build but had always been healthy and general examination revealed no abnormality.

Case No. 151. (Contd.)

Temperature: 99 - 103° for 48 hours. W.B.C.s. = 20,000 per c.mm. for 1 week.

Throat: Haemolytic streptococci isolated.

Treatment: Penicillin 100,000 units 6 - hourly for 4 days.

Mandl 's Paint locally for 6 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infect.	94	129	133	120	98	115	5	
On Infect:	122	164	178	153	144	152	49	
After Infect:	109	144	153	132	122	130	4	2 weeks
After 3 months:	98	123	135	112	96	113	3	

Case No. 152. Female. age 23. Clerkess.

Sudden onset of acute tonsillitis. Patient was subject to nasal catarrh in the winter and occasional bronchitis.

Throat: Haemolytic streptococci.

Temperature: 99 - 102° for 72 hours. W.B.C.s. = 18,000 per c.mm. for 10 days.

Treatment: Sulphatriad gm. 11. 4 - hourly for 6 days.

Mandl 's Paint locally for 8 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infect:	103	127	131	114	100	115	3	
On Infection:	119	153	164	145	138	142	33	
After Infection:	108	143	159	126	116	130	8	---- 2 weeks.
After 3 months:	98	132	136	112	100	116	7	

Case No. 153. Female. age 19. Clerkess.

Onset of acute tonsillitis. Patient had always been in good health. Moderate toxaemia.

Throat: Haemolytic streptococci.

Temperature: 98·6 - 101° for 2 days. W.B.C.s. = 14,000 per c.mm. for 1 week.

Treatment: Sulphatriad gm. $\frac{ii}{11}$. 4 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infect;	99 127 135 118 103	116	7	
On Infection:	114 156 174 163 142	150	37	
After Infection:	108 132 121 112 112	117	4	2 weeks
After 3 Months:	102 131 135 104 100	114	3	

Case No. 154. Female. age 24. Typist.

Complaint of severe coryza developing into a mild type of influenza. There were no chest complications. Patient was subject to coryza.

Nasal Swab: Staphylococcus aureus.

Temperature: 99 - 100° for 4 days.

Treatment: Aspirin S.O.S. Menthol inhalations.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	100 134 139 120 102	119	4	
On Infection:	99 134 143 112 100	118	14	
After Infection:	102 136 146 116 104	121	7	7 days
After 3 months:	104 140 143 110 100	119	9	

Case No. 155. Female. age 21. Clerkess.

Onset of coryza followed by harsh cough producing a yellowish sputum. Rales and rhonchi were audible over both lung fields.

Sputum: Pneumococci.

Temperature: 99 - 100° for 5 days.

Treatment: Warm Milk, mixture T.I.D. Menthol inhalations for 10 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	96 132 129 110 100	113	4	
On Infection:	112 134 147 123 124	128	24	
After Infection:	108 136 148 112 104	122	4	2 weeks
After 3 months:	98 127 142 116 96	116	7	

Case No. 156. Female. age 24. Physiotherapist.

Onset of acute tonsillitis; there was no previous illness.

Temperature: 99 - 103° for 3 days.

Throat: Haemolytic streptococci. W.B.C.s. = 17,000 per c.mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	96 134 127 116 100	114	7	
On Infection:	124 152 168 143 139	145	39	
After Infection:	129 146 166 138 124	121	4	3 weeks.
After 3 months:	102 124 134 112 100	114	2	

Case No. 157. Housewife. age 64.

Symptoms consisted of nausea and vomiting of 5 days duration. She had been subject to digestive upset for many years. Pyloric stenosis was

Case No. 157. (Contd.)

diagnosed and she was receiving medical treatment for this. No urinary symptoms.

Urine: Pyuria. B. coli.

Treatment: Pot. Citrate and Sod. Bicarb. gr.xxx aa T.I.D. for 10 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	116 146 165 132 122	136	29	
After Infection:	114 139 153 122 116	129	7	2 weeks
After 3 months:	110 134 149 120 108	122	9	
After 6 months:	108 136 148 124 104	124	6	

Case No. 158. Female. age 59. Cook.

Symptoms and signs of rheumatoid arthritis for 6 months; of mild degree and affecting only the hands. For many years she had been subject to pains of a fibrositic nature, but no infective focus had been determined. Evident loss of weight.

Hands: Radiologically rheumatoid arthritis.

Treatment: High Calorie Diet, Iron and Vitamins. 1 course of Gold therapy.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	126 149 164 143 119	140	54	
After Infection:	114 137 152 120 110	127	8	10 weeks
After 3 months:	102 126 134 112 100	115	9	
After 6 months:	114 129 139 120 103	121	7	

Case No. 159. Male. age 13. Schoolboy.

Typical attack of acute rheumatism, mainly affecting knees and elbows. There was a systolic murmur at the mitral area. Haemoglobin = 11 gms. Slight toxaemia.

Throat: Haemolytic streptococci.

Temperature: 99 - 103° for 4 days.

Treatment: Sod. Salicyl and Sod. Bicarb. gr.xxx aa T.I.D. for 16 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	129 143 163 154 120	142	57	
After Infection:	116 144 153 132 112	131	6	10 weeks
After 3 months:	102 126 135 112 100	115	4	
After 6 months:	99 116 132 114 102	113	7	

Case No. 160. Male. age 43. Labourer.

Developed a carbuncle of neck of 6 days duration.

Skin Carbuncle: Staphylococcus aureus.

Temperature: 99 - 102° for 4 days. W.B.C.s. = 13,000 per c.mm. for 10 days.

Treatment: Penicillin 100,000 units 6 - hourly for 20 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	113 142 153 132 108	130	46	
After Infection:	108 132 143 121 104	122	2	2 weeks
After 3 months:	102 124 140 118 104	118	4	
After 6 months:	98 132 143 112 102	117	7	

Case No. 161. Housewife. age 59.

Complaint of dermatitis of hands and forearms for 2 weeks. It had

Case No. 161. (Contd.)

become infected and a cellulitis had arisen on the forearm. A few left axillary glands were palpable. She was overweight and was subject to slight dyspnoea on exertion. No cause, apart from weight, was found. No organism isolated - presumably staphylococcus.

Temperature: 99 - 100° for 5 days. W.B.C.s. = 13,000 per c.mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

Lotio Calamine locally after infection subsided.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	113 139 151 144 129	135	19	
After Infection:	108 123 134 117 102	117	9	2 weeks
After 3 mths:	105 132 139 112 106	121	7	
After 6 mths.	98 131 141 108 100	116	9	

Case No. 162. Female. age 63. Domestic.

Vague headaches and rheumatic pains for 7 years; she was found to have a considerable degree of osteo-arthritis mainly affecting the spine and hips. There was very little limitation of movement. No urinary symptoms.

Urine: Pyuria. Staphylococcus albus.

Treatment: Pot. Citrate and Soda Bicarb. gr.xx aa T.I.D. for 9 days.

	Blood Sugars.	Average.	E.S.R.
On Infection:	104 137 159 132 114	129	8
After Infection:	109 141 157 124 112	129	5
After 3 months:	103 140 149 118 100	122	3
After 6 months:	107 135 152 112 102	122	7

Case No. 163. Male. age 14. Schoolboy.

He was admitted as a suspected appendicitis. He was found to have R. basal pneumonia. He had no cough at this time. He ultimately developed a cough with typical sputum.

Temperature: 100-103° for 4 days. W.B.C.s.= 16,000 per c.mm. for 1 week.

Sputum: Pneumococci.

Treatment: Penicillin 100,000 units 6 - hourly for 10 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	127 153 159 132 129	140	43	
After Infection:	102 136 143 124 103	122	6	2 weeks
After 3 months:	99 139 147 127 103	123	5	

Trace was lost of the patient after this.

Case No. 164. Female. Age 13 Schoolgirl.

Symptoms and signs of acute rheumatism following a sore throat 2 weeks previously.

Temperature: 100-104° for 6 days. W.B.C.s. = 14,000 per c.mm. for 2 weeks.

No organism was isolated.

Treatment: Aspirin gr.x 4 - hourly for 19 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	106 125 139 112 110	118	47	
After Infection:	99 131 141 120 104	119	7	8 weeks
After 3 months:	102 132 143 112 103	118	9	
After 6 months:	101 127 139 109 102	115	4	

Case No. 165. Female. age 62. Cleaner.

Overweight and for several years had been subject to bilateral varicose veins which caused slight ankle oedema. Cardiac sounds were soft, there was slight congestion at both lung bases. B.P.= $\frac{124}{103}$ She had been receiving injection treatment for veins and one of the sites had become septic with abscess formation.

Skin. Abscess: Staphylococcus aureus.

Temperature: 99 - 100° for 5 days.

Treatment: Incision; dry heat. Penicillin 100,000 units 6 - hourly for 14 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infection:	112	139	159	132	120	132	8	
On Infection:	129	153	165	152	131	146	24	
After Infection:	122	147	162	131	118	136	2	2 weeks.
After 3 months:	112	139	145	132	120	130	5	
After 6 months:	114	142	153	129	119	131	7	

There was a slight decrease in cardiac symptoms and signs, and this may have accounted for at least some of the reduction in blood sugar figures.

Case No. 166. Male. age 29. Porter.

He developed a sore throat following coryza of 1 weeks duration, but coryza had cleared. He was subject to sore throats.

Throat: Haemolytic streptococci

Temperature: 99 - 103° for 3 days. W.B.C.s.= 15,000 per c.mm. for 6 days.

Case No. 166. (Contd.)

Treatment: Penicillin 100,000 units 6 - hourly. Mandl 's Paint locally for 9 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infection:	110	124	139	124	100	117	3	
On Infection:	129	156	169	143	132	126	31	
On Infection:	123	142	153	132	118	134	19	
After Infection:	109	132	145	118	104	121	4	2 weeks

Patient left employment and no further trace was found.

Case No. 167. Male. age 29. Gardener.

Developed a loose cough with a muco - purulent spit. He was subject to head colds but not to chest complaints. His mother and father were both subject to bronchitis. Clinically he was a case of acute bronchitis and radiologically this was confirmed.

Sputum: Staphylococcus aureus.

Temperature: 99-101° for 5 days. W.B.C.s.= 15,000 per c.mm. for 10 days

Treatment: Warm alkaline mixture T.I.D.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infection:	102	134	132	120	100	118	7	
On Infection:	113	147	159	132	121	134	27	
After Infection:	109	139	143	120	100	122	9	3 weeks
After 3 months:	98	127	139	118	100	116	4	

Case No. 168. Housewife. age 72.

4 months history of weakness, palpitations and dyspnoea. She was pale and of thin build and a hypochromic anaemia was diagnosed. This

Case No. 168. (Contd.)

responded to Iron and Ascorbic acid therapy. She was subject to nocturia but no other urinary symptoms.

Urine: Pyuria. B. coli.

Treatment: Sulphatriad gm.1. T.I.D. for 2 weeks.

	Blood Sugars.	Average.	E.S.R.
Before Infection:	112 134 157 118 112	127	3
On Infection:	112 142 159 134 121	134	8
After Infection:	109 139 149 120 107	125	5
After 3 months:	113 136 154 127 109	128	7
After 6 months:	109 140 151 121 106	125	4

Case No. 169. Housewife. age 39.

Typical symptoms and signs of primary thyrotoxicoosis with auricular fibrillation. The symptoms had been present for 1 year. She had always been of a nervous build. She developed acute tonsillitis.

Throat: Haemolytic streptococci.

Temperature: 100 - 102° for 4 days. W.B.C.s. = 14,000 per c.mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 9 days. She was receiving Thiouracil and Digoxin for her thyrotoxic condition.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	98 126 139 124 102	118	3	
On Infection:	114 144 169 153 131	142	29	
After Infection:	109 137 153 132 120	130	3	2 weeks
After 3 months:	108 129 153 121 104	123	4	
After 6 months:	102 131 142 120 106	120	7	

Thyrotoxicosis was well controlled during investigation.

Case No. 169. (Contd.)

Patient's emotional state may have had an influence on figures but this should have been greatest in the first curve (before infection).

Case No. 170. Male. age 17. Miner.

Admitted as a ? Meningitis but was finally diagnosed by exclusion, as influenza. No organism isolated.

Temperature: 99 - 102° for 7 days. W.B.C.s. = 17,000 per c.mm. for 2 weeks.

Treatment: Aspirin S.O.S. as analgesic.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	121 153 147 132 131	137	33	
After Infection:	114 143 130 120 108	123	4	3 weeks
After 3 mths.	109 137 132 112 98	118	3	
After 6 mths.	101 142 131 114 103	118	7	

Case No. 171. Male: age 7: Schoolboy.

First came under review when past acute phase but still receiving streptomycin treatment for miliary tuberculosis. Previous health had been good.

Sputum
Organism: B. tuberculosis

Treatment: Streptomycin gm .1 twice weekly i - m for 2 months.
Sulphetrone 1.5 gm daily.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	104: 132: 129: 112: 98	115	14	
After infect.	98: 129: 134: 114: 100	115	7	- 1 month
After 3 mths.	96: 131: 124: 110: 98	111	9	

Case No. 171 (contd.)

Patient was still under review after 3 months for his tuberculous condition which was at that time considered inactive. These remarks apply to next four cases as well.

Case No. 172. Male: age 11: Schoolboy.

First came under review when past acute phase but still receiving streptomycin treatment for tuberculous meningitis. Previous health had been good.

Radiologically there was some enlargement of the L. hilar glands.

Temperature: Occasional 99° for 2 weeks.

Cerebro-Spinal fluid: B. tuberculosis.

Treatment: Streptomycin gm 1. i - m. twice weekly for 2 months and 0.1 gm intra-thecally weekly.

	Blood Sugars.				Average	E.S.R.	Return to Normal
On infection:	127:	153:	169:	143:	131	145	29	
After "	114:	139:	127:	104:	107	118	4	6 weeks
After 3 mths.	98:	123:	134:	114:	102	114	7	

Case No. 173. Male: age 19: Serviceman.

First came under review when under treatment by streptomycin for miliary tuberculosis. He had been accepted as grade I for the Army 6 months prior to present complaint and had always been in good health.

Sputum: B. tuberculosis.

Treatment: Streptomycin gm 1 i - m twice weekly.

Sulphetrone gm 1 daily for 2 months.

Case No. 173 (contd.)

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	114: 153: 164: 132: 128	138	19	
After "	108: 144: 152: 122: 109	127	4	8 weeks.
After 3 mths.	100: 136: 149: 118: 98	112	7	

Case No. 174. Female: age 9: schoolgirl.

First came under review when under treatment for tuberculous meningitis by streptomycin. Previous health had been good; at the stage when she was seen there was slight L. ear deafness and paresis of the left external rectus.

Cerebro-spinal fluid: B. tuberculosis.

Temperature= Very occasional 99.6° for 3 weeks.

Treatment: Streptomycin 0.1 gm intra-thecally weekly and gm T i - m twice weekly.

	Blood Sugars	Average	E.S.R.	Return to Normal
On infection:	116: 129: 143: 121: 112	124	22	
After infect.	104: 131: 142: 118: 100	119	4	3 weeks.
After 3 mths.	98: 121: 139: 118: 100	115	6	

Case No. 175. Female: age 15: shop assistant.

First came under review when receiving streptomycin treatment for miliary tuberculosis. Previous health had always been good.

Sputum: B. tuberculosis.

Treatment: Streptomycin gm T i - m twice weekly. Sulphetrone gm 1. B.D. for 2 months.

Case No. 175 (contd.)

	Blood Sugars	Average	E.S R.	Return to Normal
On infection:	123: 147: 172: 153: 131	145	32	
After infect.	117: 153: 162: 139: 127	140	9	2 months
After 3 mths.	108: 143: 151: 124: 107	127	4	

Case No. 176. Male: age 11: schoolboy.

First came under review when receiving streptomycin therapy for tuberculous meningitis. He was pale and there appeared to be indefinite mental changes.

Temperature: Occasional 100° for first 4 weeks.

Cerebro-spinal fluid: B. tuberculosis.

Treatment: Streptomycin gm 1 i - m. daily and 0.1 gm. intra-thecally weekly for 2 months.

	Blood Sugars	Average	E.S.R.	Return to Normal
On infection:	114: 152: 171: 132: 121	122	19	
After infect.	109: 137: 159: 144: 132	116	5	3 weeks.

Patient had a recurrence of meningeal symptoms and was returned to his parent hospital where he died.

Case No. 177. Housewife: age 62.

Symptoms of hypertension with some degree of cardiac failure but this was not marked. Main complaint was of headache and she was receiving pot. thiocyanate therapy for her hypertension. She developed acute tonsillitis with moderate toxaemia.

Throat: Haemolytic streptococci

Case No. 177 (contd.)

Temperature: 99 - 101.6° for 4 days. W.B.Cs = 17,000 per c. mm for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 6 days.

Penicillin lozenges 1 - 4 hourly 5 days.

	Blood Sugars	Average	E.S.R.	Returned to Normal
Before infection:	110: 134: 163: 132: 107	129	3	
On infection:	114: 152: 169: 134: 125	139	37	
After infection:	112: 146: 159: 142: 120	136	9	2 weeks
After 3 mths.	109: 143: 157: 127: 106	128	4	

Case No. 178: Male: age 47: Painter.

He had suffered from a duodenal ulcer for many years. He was of thin build and a degree of pyloric stenosis was noted. A gastro-enterostomy was performed; the skin stitches became septic and there was inflamation of the surrounding area.

Skin-abscesses: Staphylococcus aureus.

Temperature: 99 - 99.6° for 5 days.

Treatment: Penicillin powder locally for 10 days.

	Blood Sugars	Average	E.S.R.
On infection:	104: 136: 143: 122: 109	123	9
After infection:	110 129: 142: 120: 104	121	7
After 3 mths.	100: 131: 139: 118: 98	117 ~~171~~	5
After 6 mths.	102: 137: 143: 124: 98	121	4

Case No. 179. Housewife: age 63.

General health had been good but was overweight and had bilateral varicose veins. She developed an abscess of the vulvar region.

Case No. 179 (contd.)

Skin - abscess: Staphylococcus aureus.

Temperature: 98 - 101° for 3 days. W.B.Cs = 15,000 per c. mm for 1 week.

Treatment: Incision. Eusol dressings. Penicillin 100,000 units 6 - hourly for 10 days.

	Blood Sugars	Average	E.S.R.	Return to Normal
On infection:	119: 144: 163: 154: 132	142	52	
After infect.	112: 139: 154: 132: 120	131	2	3 weeks
After 3 mths.	114: 137: 150: 124: 119	129	3	
After 6 mths.	112: 142: 157: 131: 116	132	3	

Case No. 180. Male: age 21: Motor driver.

Pain down posterior aspect of R. leg; findings including radiology, were in keeping with a diagnosis of prolapsed intervertebral disc He developed L. otitis externa.

Temperature: 99 - 101° for 4 days. W.B.Cs = 12,000 per c. mm. for 9 days.

Skin - aural swab: Staphylococcus aureus.

Treatment: Ichthyol and glycerine pack B.D. for 10 days.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before infection:	94: 126: 132: 112: 98	112	3	
On infection:	114: 152: 171: 143: 132	142	49	
After infect.	108: 139: 147: 122: 112	126	3	2 weeks
After 3 mths.	98: 124: 136: 116: 100	115	4	

Case No. 181. Male: age 14: schoolboy.

Symptoms and signs of acute rheumatism of 3 days duration. Patient had a previous attack 4 years previously and on examination, mitral

Case No. 181 (contd.)

stenosis was noted. Attack was mild.

Throat: Haemolytic streptococci.

Temperature: 100 - 103° for 4 days W.B.Cs. = 13,000 per c. mm. for 10 days.

Treatment: Sod. Salicyl and Sod. Bi carb gr. xxx aa - 6 hourly for 23 days. Penicillin lozenges for 7 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	127: 153: 169: 132: 129	142	67	
After infect.	102: 134: 141: 121: 106	121	9	2 weeks
After 3 mths.	104: 130: 136: 115: 102	117	7	
After 6 mths.	100: 129: 141: 112: 98	116	8	

Case No. 182. Housewife: age 61

Abdominal and digestive discomfort for 5 years. On this occasion there was an exacerbation of symptoms and acute cholecystitis was diagnosed.

Temperature: 99.6 - 101.6° for 5 days. W.B.Cs = 20,000 per c. mm for 9 days. No organism was isolated.

Treatment: Penicillin 100,000 units 6 - hourly for 9 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	119: 153: 149: 131: 127	136	42	
After infect.	112: 149: 160: 142: 120	137	3	2 weeks
After 3 mths.	116: 155: 142: 124: 124	133	4	
After 6 mths.	109: 142: 149: 134: 110	129	7	

Case No. 183. Male: age 52: riveter.

Leg injured slightly at work 2 weeks previously and now area had become septic with abscess formation, lymphangitis and adenitis.

Skin - abscess: Staphylococcus aureus.

Temperature: 99° for 3 days.

Treatment: Penicillin powder. Penicillin 100,000 units 6 - hourly Dry dressing.

	Blood Sugars.	Average	E.S.R.	Returned to Normal
On infection:	114: 131: 147: 129: 112	127	16	
After infect.	108: 125: 135: 120: 110	120	9	2 weeks
After 3 mths.	104: 129: 139: 104: 101	115	7	
After 6 mths.	110: 133: 141: 109: 106	120	8	

Case No. 184. Housewife: age 64.

Abscess of L. breast of 5 days duration. Patient was overweight and gave a history of similar complaint when she was nursing one of her children, 30 years previously. She complained of dysuria but no cause was noted. There was evidence of arterio-sclerosis

Skin Abscess: Staphylococcus aureus.

Temperature: 99 - 101° for 4 days. W.B.Cs = 12,000 per c. mm. for 9 days.

Treatment: Incision. Penicillin 100,000 units 6 - hourly for 12 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	121: 154: 169: 142: 129	143	36	
After infect.	119: 146: 150; 132: 124	134	7	2 weeks
After 3 mths.	116: 142: 153: 132: 118	132	9	
After 6 mths.	114: 149: 160: 130: 120	135	9	

Case No. 185. Female: age 21: nurse.

Attack of acute tonsillitis. There was a functional systolic murmur audible at the mitral area.

Throat: Vincents organism.

Temperature: 100- 102° for 3 days. W.B.Cs = 18,000 per c. mm. for 9 days.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Hydrogen peroxide gargles for 6 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
Before infection:	94: 128: 139: 119: 101	116	4	
On infection:	116: 152: 164: 132: 129	139	38	
After infection:	108: 132: 143: 119: 109	122	9	2 weeks
After 3 months:	102: 136: 142: 116: 100	119	8	

Case No. 186. Female: age 20. Nurse.

Onset of severe coryza of 3 days duration. Patient had a Duodenal ulcer for which she was on a diet but no other specific measures were necessary. In addition to coryza, rales were audible over both lung fields but there was no cough. Patient was subject to coryza, last attack being 4 months previously.

Nasal Swab: Pneumococcus.

Temperature: 99 - 100° for 4 days.

Treatment: Aspirin s.o.s. Inhalations for 5 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
Before infection:	99: 134: 142: 118: 104	119	4	
On infection:	109: 136: 147: 121: 111	125	14	
After infection:	103: 137: 141: 130: 109	124	9	1 week
After 3 months.	105: 141: 138: 120: 100	121	9	

Case No. 187. Female: age 21: nurse.

Attack of acute tonsillitis of 24 hours duration.

Throat: Haemolytic streptococci

Temperature: 99 - 103° for 2 days. W.B.C . = 21,000 per c. mm for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Mandls paint locally for 7 days.

	Blood Sugars.					Average	E.S.R.	Return to Normal
Before Infection:	89:	134:	129:	116:	94	112	7	
On infection:	119:	143:	152:	131:	124	134	52	
After infection:	109:	129:	132:	112:	104	117	2	3 weeks
After 3 months:	94:	127:	130:	112:	99	112	3	

Case No. 188. Female: age 20: nurse.

3 days history of urinary frequency and dysuria. There was general malaise and nausea.

Urine: Pyuria. B. coli.

Temperature: 99-100° for 4 days.

Treatment: Sulphatriad gm ii 6 - hourly for 7 days.

	Blood Sugars.					Average	E.S.R.	Return to Normal
Before infection:	100:	131:	129:	116:	98	117	7	
On infection:	102:	131:	141:	124:	112	122	19	
After infection:	98:	129:	136:	120:	110	118	7	7 days.
After 3 months	94:	130:	135:	118:	102	116	4	

Case 189. Female: age 19. nurse.

Attack of acute tonsillitis of 36 hours duration. She was subject to headache but no cause for this was determined.

Throat: Haemolytic streptococci.

Temperature: 99 - 102° for 2 days. W.B.Cs. = 17,000 per c. mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.
Mandl's Paint locally for 7 days.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before infection:	89: 128: 140: 116: 98	114	3	
On infection:	110: 142: 156: 143: 132	137	42	
After infection:	100: 129: 134: 122: 110	119	7	2 weeks
After 3 months:	102: 132: 147: 118: 112	122	2	
After 6 months:	98: 131: 136: 110: 102	115	4	

Case No. 190. Male: age 29: gardener.

5 days history of impetigo of face. He was subject to sore throats, the last one being 4 months previously. He was also subject to sycosis barbae but this was not evident on this occasion.

Skin: Streptococci

Treatment: Penicillin cream. B.D. for 8 days.

	Blood Sugars.	Average	E.S.R.
Before infection:	94: 129: 132: 117: 98	114	3
On infection:	99: 132: 128: 112: 102	115	5
After infection:	94: 130: 124: 110: 98	111	4
After 3 months:	90: 132: 124: 116: 94	111	5

Case No. 191. Housewife. age 67.

Symptoms and signs of myocardial degeneration. There was ankle oedema and cardiac sounds were poor. B.P.= 150/88. For several years she had been subject to a productive cough but 3 days prior to admission complaint of pain in L. lower chest and worsening of symptoms. L. lobar pneumonia was diagnosed.

Sputum: Pneumococci isolated.

Temperature: 99 - 101° for 5 days. W.B.C.s.= 14,000 per c.mm. for 2 weeks.

Treatment: Digoxin for 4 weeks.

Penicillin 100,000 units 6 - hourly for 12 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	124 159 172 143 140	148	62	
After Infection:	116 149 153 130 124	134	4	4 weeks.
After 3 months:	112 145 149 124 116	129	4	
After 6 months:	114 139 150 124 110	127	7	

Myocardial degeneration symptoms and signs were much improved at end of period of investigation.

Case No. 192. Male. age 47. Factory worker.

Chronic nephritis for 8 years and was in for investigation of this symptom. He was subject to headaches and this was the main complaint. He had a fracture R. leg 6 years previously.

Throat: Haemolytic streptococci. Symptomless.

Treatment: Penicillin lozenges 1 - 4 hourly for 3 days.

Penicillin 100,000 units 6 - hourly for 5 days.

Case No. 192. (Contd.)

	Blood Sugars.	Average.	E.S.R.
On Infection:	98 124 136 112 102	114	5
After Infection:	94 132 130 108 90	111	4
After 3 months:	91 126 130 120 94	112	7

Patient did not report for further review.

Case No 193. Housewife. age 56.

Dyspepsia and abdominal pains, not related to food, for many years. Full investigation revealed no definite organic cause but teeth appeared carious. There was a marked nervous overlay in this case.

No organism isolated.

Teeth: Carious. Radiologically some alveolar absorption noted.

Treatment: Extractions.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	102 129 134 124 104	119	22	
After Infection:	100 132 139 120 98	118	3	7 days.
After 3 months:	104 136 124 116 106	117	4	
After 6 months:	100 138 132 114 103	117	7	

Case No. 194. Male. age 62. Labourer.

3 months history of renal colic on L, side. Examination revealed a L. renal calculus with hydronephrosis and renal function was good.

Urine: Pyuria. B. coli.

Temperature: Occasional 99-100° during 3 weeks preparatory to operation.

Treatment: L. nephrectomy. W.B.C.s.= 13,000 per c.mm. for 1 week.

Case No. 194. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	112 146 159 134 128	136	34	
After Operation:	109 132 157 124 112	127	6	2 weeks
After 3 months:	102 135 140 120 100	119	4	
After 6 months:	104 142 138 124 106	123	7	

Case No. 195. Male. age 14. Schoolboy.

First seen as pyrexia of unknown origin. He developed a bilateral otitis externa but no other abnormality was noted.

Skin: Aural Swab: Staphylococcus albus.

Temperature: 99 - 101° for 5 days. W.B.C.s. = 21,000 per c.mm. for 2 weeks.

Treatment: Albucid ear drops T.I.D. for 12 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	104 156 179 141 132	142	68	
After Infection:	98 134 152 140 124	130	3	3 weeks.
After 3 months:	90 134 136 118 100	116	4	
After 6 months:	94 136 124 112 98	113	7	

Case No. 196. Housewife. age 64.

Markedly overweight and developed a rash of lower abdomen and under breasts. The rash formed small pustules.

Skin: Staphylococcus albus.

Treatment: Castellani's paint B.D. for 3 weeks.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	108 134 154 129 106	130	17	
After Infection:	104 142 160 128 108	128	4	2 weeks

Case No. 196. (Contd.)

	Blood Sugars.	Average.	E.S.R.
After 3 months:	107 148 156 132 110	131	7

Patient did not report for further review.

Case No. 197. Male age 9. Schoolboy.

3 days history of acute rheumatism affecting mainly the arms. He had been subject to sore throats.

No organism isolated.

Temperature: 99 - 103° for 3 days.

Treatment: Sod. Salicyl and Sod. Bicarb. gr.xxx aa 6 - hourly for 3 weeks.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	97 127 134 112 104	115	49	
After Infection:	94 132 124 116 100	113	7	8 weeks
After 3 months:	98 123 136 110 92	110	4	
After 6 months:	100 134 128 118 98	116	9	

Case No. 198. Female. age 53. Cleaner.

Subject to varicose veins for many years and now had developed a varicose ulcer. She was subject to dyspnoea on exertion and also subject to coryza and post-nasal catarrh, but last attack was 3 months previously.

Skin: Ulcer: Staphylococcus albus. W.B.C.s. = 14,000 per c.mm. for 1 week.

Treatment: Rest. Penicillin powder. Tulle gras dressing for 4 weeks.

Case No. 198. (Contd.)

	Blood Sugars.	Average.	E.S.R.
On Infection:	114 142 138 121 116	126	8
After Infection:	110 149 132 118 108	123	7
After 3 months:	108 142 140 118 104	122	8
After 6 months:	112 132 144 124 116	128	3

Case No. 199. Male. age 71. Farmer.

Receiving treatment for pernicious anaemia and this was responding satisfactorily, blood figures being at the lower limits of normal. He had been complaining of nocturia for several years and the prostate was slightly enlarged. He developed frequency and dysuria.

Urine: Pyuria. B. coli.

W.B.C.s.= 14,000 per c.mm. for 10 days.

Treatment: Sulphatriad gm.1. T.I.D. for 14 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	105 139 147 129 109	126	3	
On Infection:	124 157 183 139 129	146	39	
After Infection:	110 142 138 118 108	123	9	3 weeks
After 3 months:	112 148 144 122 110	127	4	

Case No. 200. Male. age 23. Nurse.

Attack of acute tonsillitis of 48 hours duration; previous health had always been good. General toxaemia.

Throat: Haemolytic streptococci.

Temperature: 99 - 101° for 4 days. W.B.C.s.= 13,000 per c.mm. for 10 days.

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

Mandl's paint locally for 10 days.

Case No. 200. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	94 129 138 111 88	112	5	
On Infection:	106 134 142 128 116	125	44	
After Infection:	102 141 128 116 104	118	9	4 weeks.
After 3 months:	94 134 127 110 98	113	8	

Case No. 201. Female. age 29. Factory worker.

Septic R. thumb following a cut 5 days previously. There was evident pus, lymphangitis and lymphadenitis. Apart from occasional coryza, previous health was good. Last attack of coryza was 5 - 6 months previously.

Skin Abscess: Staphylococcus aureus.

Temperature: 99 - 100° for 4 days. W.B.C.s. = 12,000 per c.mm. for 1 week.

Treatment: Incision. Penicillin 100,000 units 6 - hourly for 4 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	99 134 138 124 104	120	24	
After Infection:	94 142 133 120 98	117	4	1 week
After 3 months:	90 138 130 118 98	117	3	
After 6 months:	92 141 128 112 98	114	7	

Case No. 202. Male. age 34. Engineer.

Sustained laceration of hand at work and this became septic. General health had always been good, but he stated that he was subject to septic spots on his face; he blamed the oil and grease at his work for this.

Skin Lacerations: Staphylococcus aureus.

Case No. 202 (contd.)

Treatment: Penicillin powder locally. Penicillin 100,000 units 6 - hourly for 4 days.

	Blood Sugars.					Average	E.S.R.	Return to Normal
On infection:	100:	142:	152:	124:	122	128	14	
After infect.	104:	146:	139:	118:	112	123	4	2 weeks
After 3 mths.	94:	131:	123:	104:	96	110	7	
After 6 mths.	98:	143:	128:	106:	100	115	4	

The recurrent septic spots to which he was subject may have had a constant effect on carbohydrate tolerance.

Case No. 203. Housewife: age 58.

Symptoms and signs of mild myocardial failure probably secondary to her pulmonary condition. She had a chronic cough with mucopurulent sputum for many years. The findings, including radiology, were those of chronic bronchitis and emphysema.

Patient was of thin build and had become introspective.

Sputum: Pneumococci. W.B.Cs. = 13,000 per c. mm for 2 weeks.

Treatment: Warm alkaline mixture. Penicillin inhalations and Penicillin 100,000 units 6 - hourly for 2 weeks.

Resulted in sputum being less purulent.

	Blood Sugars					Average	E.S.R.	Return to Normal
On infection:	119:	144:	139:	132:	124	132	11	
After infect.	106:	143:	132:	120:	100	120	9	3 weeks
After 3 mths.	108:	139:	128:	114:	106	119	4	
After 6 mths.	110:	141:	124:	118:	104	119	7	

Case No. 203 (contd.)

All that can be said in this case is that the infective element was made less.

Case No. 204. Male: age 19.

Axillary abscess for 3 weeks, increasing in size. Previous health had been good.

Skin - abscess: Staphylococcus aureus.

Temperatures: 99-100° for 2 days.

W.B.Cs. = 21,000 per c. mm. for 1 week.

Treatment: Incision. Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	106: 139: 152: 143: 134	135	24	
After infect.	102: 142: 128: 124: 110	122	6	3 weeks
After 3 mths.	94: 138: 132: 114: 100	118	4	

Case No. 205. Female: age 14; schoolgirl.

Symptoms and signs of acute rheumatism of 2 weeks duration. A systolic murmur was heard at the mitral area. Tonsils were enlarged but not septic. No organism isolated.

W.B.Cs. = 16,400 per c. mm for 10 days.

Temperature: 100 - 102° for 4 days.

Treatment: Aspirin gr. xx 6 - hourly for 17 days.

	Blood Sugars	Average	E.S.R.	Return to Normal
On infection:	112: 143: 164: 132: 124	135	68	
After infect.	104: 134: 143: 118: 110	122	7	9 weeks

Case No. 205 (contd.)

	Blood Sugars.					Average	E.S.R.	Return to Normal
After 3 mths.	88:	124:	130:	104:	94	108	9	
After 6 mths.	92:	128:	124:	110:	98	112	4	

Case No. 206. Female: age 23: clerkess.

Acute onset of coryza of 3 days duration. Dry unproductive cough and lung fields clear. Previous health had been good.

Nasal & Throat Swab: Staphylococcus albus.

Temperature: 99 - 100° for 4 days.

Treatment: Aspirin, inhalations and Syrup Codein. Phosph. s.o.s.

	Blood Sugars					Average	E.S.R.	Return to Normal
Before infection:	89:	131:	124:	94:	86	106	8	
Before infection	88:	124:	120:	112:	90	107	4	
On infection:	104:	136:	124:	120:	112	119	12	
After infect.	98:	132:	120:	114:	104	114	4	2 weeks
After 3 mths.	94:	128:	126:	110:	90	110	7	

Case No. 207. Female: age 28: nurse.

Acute tonsillitis for 24 hours; patient was subject to these attacks, last one being 2 years previously. She was also subject to vague aches of a fibrositic nature. Slight toxaemia.

Throat: Haemolytic streptococci.

Blood Culture: Staphylococcus albus ? contaminant.

Temperature: 99 - 102° for 3 days. W.B.Cs = 21,000 per c. mm for 9 days.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Penicillin lozenges 1 - 4 hourly for 7 days.

Case No. 207 (contd.)

	Blood Sugars	Average	E.S.R.	Return to Normal
Before infection:	92: 124: 138: 118: 100	114	3	
On infection:	100: 142: 154: 143: 131	134	31	
After infection:	98: 134: 140: 131: 120	125	7	3 weeks
After 3 months	94: 130: 132: 120: 98	115	4	

Case No. 208. Male: age 56. Carter.

Crop of boils on neck for 10 days. Patient had a similar complaint 3 years previously.

Skin Boils: Staphylococcus aureus

Blood Culture: Staphylococcus aureus

W.B.Cs: 20,000 per c. mm. for 2 weeks.

Temperature: 99 - 101° for 5 days.

Treatment: Penicillin 100,000 units 6 - hourly for 12 days.

	Blood Sugars	Average	E.S.R.	Return to Normal
On infection:	124: 157: 183: 164: 147	155	49	
After infect.	112: 145: 153: 132: 120	132	6	5 weeks
After 3 mths.	104: 138: 143: 122: 108	123	4	
After 6 mths.	102: 141: 133: 118: 100	121	7	

Case No. 209: Housewife: age 53.

Multitude of symptoms of nervous type; no organic cause for these was found. She did develop dysuria and frequency of micturition.

Urine: Pyuria. B. coli.

Treatment: Pot. citrate and Sod. Bi-carb. gr. xxx aa T.I.D. for 10 days.

Case No. 209 (contd.)

	Blood Sugars.					Average	E.S.R.
Before infection:	102:	136:	142:	124:	104	122	8
On infection:	108:	143:	148:	118:	100	123	4
After infection:	100:	139:	144:	120:	104	122	7
After 3 months	102:	142:	131:	114:	100	118	4

Figures may have been raised due to patient's emotional state.

Case No. 210. Housewife: age 49.

Abscess of R. groin of 5 days duration. She was overweight and had a cholecystectomy done 4 years ago. She was dyspnoeic on exertion, cardiac sounds were of soft quality. B.P = 158/92

Skin - abscess: Staphylococcus aureus. W.B.Cs. = 14,000 per c. mm for 2 weeks.

Treatment: Incision. Sulphatriad gm. $\frac{..}{II}$ 4 - hourly for 5 days.

	Blood Sugars					Average	E.S.R.	Return to Normal
On infection:	122:	154:	147:	143:	135	140	32	
After infect.	112:	143:	130:	120:	110	123	4	3 weeks
After 3 mths.	104:	140:	144:	118:	108	122	7	
After 6 mths.	108:	142:	124:	110:	104	118	4	

Case No. 211. Housewife: age 49.

Subject to asthmatic attacks in childhood but had no chest complaints until she developed a R. basal pain and lobar pneumonia was confirmed. She was of thin build but had previously been healthy.

Sputum: Pneumococcus.

Temperature: 99 - 102° for 5 days. W.B.Cs. = 19,000 per c. mm for 2 weeks.

Case No. 211 (contd.)

Treatment: Penicillin 100,000 units 6 - hourly for 11 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	114: 153: 144: 122: 120	131	29	
After infect.	104: 139: 143: 120: 112	122	7	3 weeks
After 3 mths.	106: 142: 146: 124: 104	124	4	
After 6 mths.	103: 142: 134: 114: 100	119	9	

Case No. 212. Male: age 9.

Onset of L. basal pain and a L. basal lobar pneumonia was noted. He had acute rheumatism 1 year previously and there was evidence of rheumatic carditis. There was some degree of cardiac failure.

No organism isolated.

Temperature: 100-102° for 5 days. W.B.Cs. = 22,000 per c. mm. for 2 weeks.

Treatment: Penicillin 100,000 units 6 - hourly for 12 days.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before infection	94: 132: 124: 108: 92	110	4	
On infection:	110: 144: 129: 122: 116	124	24	
After infection	102: 132: 124: 118: 104:	116	8	5 weeks
After 3 months	94: 128: 116: 104: 96:	108	3	

Cardiac state may have had an influence in raising the blood sugar figures as it was worst at the height of infection.

Case No. 213. Male: age 53: labourer.

Septic finger of R. hand for 2 days. He did not know how it began. General health otherwise good. There was a L. axillary adenitis.

Skin: Abscess - Staphylococcus aureus

Temperature: 99 - 101° for 2 days. W.B.Cs. 22,000 per c. mm for 1 week.

Treatment: Incision. Dry heat. Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars	Average	E.S R.	Return to Normal
On infection:	112: 152: 147: 124: 108	129	27	
After infect.	99: 134: 122: 109: 94	120	6	1 week
After 3 mths.	104: 146: 134: 116: 100	120	9	
After 6 mths.	98: 142: 130: 112: 94	117	7	

Case No. 214: Female: age 47: Hosiery worker.

Left axillary, abdominal and inguinal abscesses of 7 days duration. Patient was overweight and had always been subject to mild skin complaints. B.P. - 174/104; fundi showed slight silver wiring of the arteries.

Skin Abscesses: Staphylococcus aureus.

Treatment: Elastoplast: Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
On infection:	112: 134: 124: 112: 104	117	24	
After infect.	106: 138: 130: 122: 103	120	4	2 weeks
After 3 mths.	110: 142: 128: 112: 100	120	7	
After 6 mths.	98: 131: 124: 102: 96	110	9	

Case No. 215. Housewife: age 34.

Symptoms and signs of hypertension. B.P = 200/116. Main complaint was of headache: she was receiving potassium thiocyanate therapy. She developed acute tonsillitis with severe toxaemia.

Throat: Haemolytic streptococci.

Temperature: 99 - 103° for 4 days. W.B.Cs. = 23,000 per c. mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Mandls Paint locally for 8 days.

	Blood Sugars.	Average	E.S.R.	Return to Normal
Before infection:	98: 134: 147: 131: 100	122	3	
On infection:	104: 146: 159: 134: 122	133	53	
After infection:	110: 139: 148: 120: 108	125	9	2 weeks
After 3 months:	99: 143: 130: 112: 100	117	9	

Case No. 216. Housewife: age 49.

Receiving treatment for chronic gastritis which she had for 3 years. She developed frequency of micturition and dysuria of 3 days duration.

Temperature: 99° for 4 days.

Treatment: Sulphatriad gm 1 T.I.D. 1 month.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before infection:	104: 143: 152: 134: 112	129	9	
On infection:	108: 139: 149: 124: 109	125	24	
After infection:	100: 142: 134: 122: 103	120	4	1 week
After 3 months:	98: 139: 150: 124: 100	122	7	

Case No. 217. Housewife. age 57.

After cutting nails, patient noticed that inflammation of the nail bed of the R. hallux had begun. There was marked local pain and tenderness. General malaise.

No organism isolated.

Temperature: 99° occasionally for 1 month.

Treatment: Penicillin 100,000 units 6 - hourly for 9 days.

	Blood Sugars.	Average.	E.S.R.
On Infection:	104 142 134 121 106	123	9
After Infection:	106 139 143 116 108	122	4
After 3 months:	99 143 129 124 103	120	7
After 6 months:	102 140 128 116 101	117	4

Case No. 218. Male. age 26. Baker.

Sustained fractured ribs and while in hospital developed an acute tonsillitis with moderate toxaemia.

Throat: Haemolytic streptococci.

Temperature: 99 - 102° for 4 days. W.B.Cs. = 17,000 per c.mm. for 1 week.

Treatment: Penicillin 100,000 units 6 - hourly for 7 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	104 139 143 114 102	120	34	
After Infection:	100 142 126 112 104	117	2	3 weeks.
After 3 months:	98 132 138 110 94	114	3	
After 6 months:	89 131 124 100 89	107	7	

It was not known if the fractured ribs had any influence on the sugar tolerance or on the E.S.R.

Case No. 219. Male. age 18. Student.

Vague abdominal pains for 4 months. Diagnosed as chronic appendicitis. Apart from occasional coryza, patient had no other complaints. He had no coryza for the past 6 months.

Appendix: B. coli.

Temperature: Occasional 99° for 4 days prior to operation.

Treatment: Appendicectomy.

	Blood Sugars.					Average.	E.S.R.
On Infection:	88	124	134	116	92	111	9
After Infection:	92	120	130	114	90	109	5
After 3 months:	84	132	120	112	94	108	4
After 6 months:	93	126	120	114	96	110	9

Case No 220. Female. age 21. Factory Worker.

Vague abdominal pains and digestive upsets at intervals for 2 years. Diagnosed as chronic appendicitis. There were no other previous illnesses.

Appendix: B. coli.

Treatment: Appendicectomy.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
On Infection:	94	132	143	124	116	122	24	
After Infection:	92	124	130	112	100	112	4	3 weeks
After 3 months:	88	127	120	104	94	107	5	
After 6 months:	91	130	128	102	98	114	7	

Case No. 221. Male. age 12. Schoolboy.

6 months history of vague digestive complaints. One week before admission he had a bout of severe abdominal pain and nausea but this had

Case No. 221. Male. age 12. (Contd.)

settled. Diagnosed as chronic appendicitis.

Appendix. No organism isolated.

Treatment: Appendicectomy.

	Blood Sugars.	Average.	E.S.R.
On Infection:	94 131 129 112 100	113	7
After Infection:	89 127 124 104 94	108	6
After 3 months:	92 132 121 114 90	110	8
After 6 months:	94 131 116 112 94	109	4

Case No. 222. Male. age 13. Schoolboy.

3 years history of intermittent pain in the R.I.F. Occasional nausea and vomiting and tended to be constipated. Chronic appendicitis was diagnosed. No organism isolated.

Treatment: Appendicectomy.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	100 143 136 124 114	124	16	
After Infection:	94 136 142 116 104	118	9	3 weeks.
After 3 months	88 129 134 109 94	113	4	

Did not report for further observations.

Case No. 223. Housewife. age 43.

History of transient loss of power of legs 20 years previously and since then subject to mild ataxia which had become more severe recently. Disseminated sclerosis was diagnosed. No urinary symptoms.

Urine: Pyuria. B. coli.

Treatment: Pot. Citrate and Sod. Bicarb. gr.xxx aa T.I.D. for 9 days.

Case No.223. (Contd.)

	Blood Sugars.	Average.	E.S.R.
On Infection:	112 134 146 124 114	126	9
After Infection:	110 142 136 122 108	124	7
After 3 months:	108 146 138 116 103	122	9
After 6 months:	110 139 143 124 108	125	3

Case No. 224. Male age 43. Turner.

Patient had a confirmed duodenal ulcer which was active. He developed a septic finger while in hospital. Apart from the pain there was no general upset. No organism isolated.

Temperature: Occasional 99° for 4 days.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	98 132 140 124 103	119	9	
On Infection:	106 143 156 138 120	135	19	
After Infection:	102 139 142 121 110	123	4	2 weeks
After 3 months:	94 141 133 116 98	116	7	

Case No. 225. Female. age 19. Nurse.

Onset of acute tonsillitis of 36 hours duration. Slight toxaemia

Throat: Haemolytic streptococci.

Temperature: 99 - 102° for 2 days. W.B.C.s.= 22,000 per c.mm. for 1 week

Treatment: Penicillin 100,000 units 6 - hourly. Mandl's Paint locally.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection	84 123 131 114 94	109	4	
On Infection:	100 134 153 143 124	131	34	
After Infection:	98 126 144 134 109	122	7	3 weeks

Case No. 225. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Return to normal.
After Infection:	98 126 144 134 109	122	7	3 weeks
After 3 months:	92 134 124 108 94	110	8	

Case No. 226. Male age 36. Carter.

Receiving treatment for pernicious anaemia and blood count was normal by the time of the investigation. He had been receiving liver therapy for 4 years. He had acute bronchitis 10 years previously and was subject to coryza. He contracted a severe coryza while in the ward.

Nasal and Throat Swab: Staphylococcus albus.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	104 132 146 124 106	122	3	
On Infection:	112 142 149 134 120	131	17	
After Infection:	109 137 141 123 104	123	9	1 week
After 3 months:	102 136 140 118 100	119	4	

Case No. 227. Female. age 11.

Symptoms and signs of acute rheumatism; she was subject to sore throats and had one 2 months previously. No organism isolated.

Temperature: 100 - 101° for 5 days.

W.B.C.s. = 16,000 per c.mm. for 10 days.

Treatment: Aspirin gr. x 4 - hourly for 23 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	124 156 187 142 131	128	83	
After Infection:	109 141 135 112 116	123	5	3 weeks
After 3 months:	94 136 140 110 98	116	7	

Case No. 227. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Return to normal.
After 6 nonths:	100 136 132 118 102	118	9	

The effects of the previous sore throat may not have worn off by the time investigations were started here.

Case No. 228. Housewife. age 59.

Symptoms and signs of mild cardiac failure, mainly left sided. A few rales were audible at lung bases. B.P.= 174/102. History of failure only extended over the past 3 weeks.

Throat: Haemolytic streptococci. Symptomless.

Treatment: Penicillin lozenges 1-4 hourly for 5 days.

	Blood Sugars.	Average.	E.S.R.
On Infection;	104 136 150 139 107	127	9
After Infection:	108 142 153 129 106	128	4
After 3 months:	110 146 139 122 108	125	7
After 6 months:	104 143 134 120 106	121	4

There was an improvement in the cardiac condition during hospitalisation but this did not result in any improvement in the carbohydrate tolerance.

Case No. 229. Female age 64.

4 days history of general malaise and anorexia. After 4 days icteric tinge noted in conjunctivas and icterus spread to involve all skin. Diagnosis of infective hepatitis, [illegible].

No organism isolated.

Case No. 229. (Contd.)

Temperature: 99 - 101° for 10 days.

Treatment: Glucose drinks.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	116 142 151 128 122	132	46	
After Infection:	100 139 132 110 104	117	9	2 weeks
After 3 months:	103 141 130 118 100	118	8	
After 6 months:	102 139 134 120 100	119	9	

Case No. 230. Housewife. age 63.

Abdominal complaints of gall-bladder nature for many years. Cholecystectomy was performed. During convalescence, a crop of boils of the buttocks broke out.

Skin - Boils: Staphylococcus aureus.

Temperature: 99° for 5 days.

W.B.C.s. = 13,000 per c.mm. for 20 days.

Treatment: Penicillin 100,000 units 6 - hourly.

	Blood Sugars.	Average.	E.S.R.
On Infection:	114 142 134 120 112	124	9
After Infection:	104 143 130 112 108	119	4
After 3 months:	99 139 140 120 102	120	7
After 6 months:	101 142 132 118 100	119	4

Case No. 231. Male. age 37. Baker.

Rheumatic fever when age 11 and since then suffered from rheumatic carditis. Auricular fibrillation was present and he was admitted because of a mild degree of cardiac failure. He developed a pustular rash of his hands when in hospital, but the exact nature of this was not determined.

Case No. 231. (Contd.)

Skin Rash: Staphylococcus albus.

Treatment: Penicillin 100,000 units 6 - hourly for 12 days.

	Blood Sugar.	Average.	E.S.R.
Before Infection:	104 139 132 122 100	119	3
On Infection:	108 147 131 116 102	121	7
After Infection:	100 141 130 112 100	117	6
After 3 months:	102 137 128 114 98	116	4

Myocardial symptoms and signs had improved after period of rest.

Case No. 232. Male. age 27. Labourer.

Following an accident at his work, his R. leg had to be amputated at mid-thigh level. The stump became septic.

Skin - Abscess. Staphylococcus aureus.

Blood Culture: Staphylococcus aureus.

W.B.C.s. = 16,000 per c.mm. for 10 days.

Temperature: 99 - 102° for 5 days.

Treatment: Penicillin powder. Penicillin 100,000 units 6 - hourly for 23 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	134 157 193 174 164	164	53	
After Infection:	114 142 150 130 116	130	2	3 weeks
After 3 months:	103 134 136 118 100	116	4	
After 6 months:	98 140 132 112 100	116	7	

Case No. 233. Housewife. age 43.

Left mastectomy performed because of carcinoma; there did not appear

Case No. 233. (Contd.)

to be any secondary spread. The stitch lines became septic and pus formed.

Skin: Staphylococcus aureus.

Temperature: 99 - 101° for 3 days.

Treatment: Penicillin 100,000 units 6 - hourly for 8 days.

Penicillin powder locally for 12 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	113 144 137 124 120	128	16	
After Infect:	108 134 130 114 100	118	4	2 weeks.
After 3 months:	104 139 128 110 108	118	7	
After 6 months:	100 141 131 114 102	118	9	

Case No. 234. Male. age 34.

Gastric ulcer for many years; a partial gastrectomy was performed.

The stitch lines became septic and pus formed at one point.

Skin Abscess: Staphylococcus aureus.

Temperature: 99-100° for 2 days.

Treatment: Penicillin powder to wound for 5 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	106 139 140 122 103	124	16	
After Infection:	101 142 134 114 100	118	4	1 week.
After 3 months:	98 134 124 120 100	115	7	
After 6 months:	100 142 134 118 102	119	3	

Case No. 235. Male. age 14. Schoolboy.

Lacerations of R. forearm and this had become septic with axillary adenitis. Previous health had been good.

Skin: wounds. Staphylococcus aureus.

Temperature: 99-99·6° for 4 days. W.B.C.s. = 12,000 per c.mm. for 6 days.

Treatment: Penicillin powder locally and 100,000 units 6 - hourly for 8 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
On Infection:	106	134	141	124	108	123	23	
After Infection:	100	140	128	118	100	117	8	1 week
After 3 months:	88	124	134	114	100	112	6	
After 6 months:	92	129	137	112	98	114	7	

Case No. 236. Female. age 61. Schoolteacher.

She had suffered from digestive symptoms for many years and full investigation had revealed no organic cause. It was thought however, that her appendix might be pathological.

Appendix: B. coli.

Treatment: Appendicectomy.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
On Infection:	104	129	140	124	108	121	19	
After Infection:	100	134	142	120	102	120	8	2 weeks
After 3 months:	102	141	138	118	104	121	4	
After 6 months:	110	139	129	118	108	121	7	

Case No. 237. Housewife. age 55.

Rheumatoid arthritis for 18 months. When first seen it was in an active phase. She had been subject to 'rheumatics' for many years.

No organism isolated.

Treatment: Gold therapy. 1 course.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
On Infection:	124 144 173 152 136	146	58	
After Infection:	109 131 152 122 116	126	9	10 weeks.
After 3 months:	105 141 148 120 103	123	4	

Patient did not report for further review.

Case No. 238. Male. age 52. Miner.

Receiving treatment for gastric ulcer. By time of observation, it was inactive. He contracted an acute tonsillitis to which he was subject.

Throat: Haemolytic streptococci

Temperature: 100 - 103° for 3 days. W.B.C.s.= 20,000 per c.mm. for 5 days.

Treatment: Penicillin 100,000 units 6 - hourly for 5 days.

Penicillin lozenges 1 - 4 hourly for 4 days.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before Infection:	102 128 139 108 100	115	7	
" "	102 132 143 124 100	120	4	
On Infection:	114 143 138 122 118	127	25	
After Infection:	104 142 124 114 100	117	9	1 week
After 3 months:	98 134 126 110 94	112	4	

Case No. 239. Female. age 22. Clerkess.

Onset of severe coryza with tracheitis; chest was clear. Patient was not specially subject to coryza. She had a sore throat 5 months previously.

Throat and Nasal Swabs: Staphylococcus aureus.

Temperature: 99 - 100° for 3 days.

Treatment: Inhalations. Aspirin S.O.S. for 8 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infection:	87	121	112	108	93	104	3	
On Infection:	100	132	120	114	98	113	24	
After Infection:	93	130	122	112	100	111	2	1 week
After 3 months:	90	124	116	103	92	105	4	

Case No. 240. Female. age 19. Nurse.

3 days history of dysuria and frequency of micturition. Slight general malaise but no other upset.

Urine: Pyuria. B. coli.

Temperature: 99 - 99·6° for 4 days.

Treatment: Sulphatriad gm. 1 T.I.D. for 9 days.

	Blood Sugars.					Average.	E.S.R.	Return to normal.
Before Infection:	90	132	124	100	94	106	5	
On Infection:	102	141	132	108	97	116	21	
After Infection:	94	140	128	112	98	116	9	2 weeks
After 3 months:	88	124	118	102	92	105	4	

Case No. 241. Male. age 36. Joiner.

Diabetes for 2 years. He had always been fit apart from this complaint. His father had diabetes.

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
Before TABC.	164 159 143 158	156	4		20 P.Z.I.
On T.A.B.C.	184 176 154 189	176	32		" " "
After T.A.B.C.	174 160 160 179	168	8	2 weeks.	" " "
After 3 months.	160 164 138 154	154	4		" " "

Case No. 242. Housewife. age 53.

Diabetes for 5 years. She was being investigated for complaint of abdominal discomfort but no abnormality was noted. She had no recent infections, last one being 8 months previously when she had coryza.

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	198 187 153 176	179	3		Nil.
On T.A.B.C.	203 199 184 200	197	24		Nil.
After T.A.B.C.	210 184 164 189	187	9	3 weeks	Nil.
After 3 months.	184 188 160 174	177	4		Nil.

Case No. 243. Housewife. age 63.

Diabetes for 10 years. Symptoms suggestive of gall-stones for 10 years and cholelithiasis was noted. Cholecystectomy carried out and then observations made after 4 months.

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	232 246 202 224	226	7		Nil.
On T.A.B.C.	256 260 212 238	241	44		Nil.

Case No. 243. (Contd.)

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
After T.A.B.C.	240 238 209 219	227	7	3 weeks	Nil.
After 3 months.	230 239 198 230	224	4		Nil.

Case No. 244. Male. age 22. Miner.

Diabetes for 6 months. He had appendicectomy 9 years previously, but was otherwise well.

	Blood Sugars.	Average	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	200 164 163 173	175	4		20 Sol.a.m.& 8 Sol.p.m.
On T.A.B.C.	224 179 169 189	190	23		" " " " " "
After T.A.B.C.	218 169 160 169	154	6	2 weeks.	" " " " " "
After 3 months.	202 159 160 168	172	4		" " " " " "

Case No. 245. Housewife. age 64.

Diabetes for 4 years; symptoms of mild cardiac failure for 2 years, mainly dyspnoea and slight ankle oedema. She had a hysterectomy 10 years previously and had 'flu 1 year ago.

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	224 239 200 236	225	7		Nil.
On T.A.B.C.	253 271 214 258	249	42		Nil.
After T.A.B.C.	239 243 205 242	232	4	4 weeks.	Nil.
After 3 months.	230 236 198 229	223	3		Nil.

Case No. 246. Male. age 64.

Diabetes for 12 years; he had pneumonia on 2 occasions many years previously. He was subject to a smoker's cough, but no abnormality of

Case No. 246. (Contd.)

chest was noted clinically or radiologically.

	Blood Sugars.	Average	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	184 156 142 159	160	4		8 P.Z.I.
On T.A.B.C.	191 174 153 180	175	20		" " "
After T.A.B.C.	173 158 143 168	161	7	2 weeks.	" " "
After 3 months.	179 154 153 160	162	4		" " "

Case No. 247. Male. age 14. Schoolboy.

Diabetes for 1 year; symptoms of abdominal discomfort. He was under observation as ? appendicitis, but symptoms thought to be due to constipation. Previous health good.

	Blood Sugars.	Average	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	184 163 159 167	168	7		42 Soluble a.m. &28 Soluble p.m.
On T.A.B.C.	192 174 161 183	178	21		" " " "
After T.A.B.C.	176 168 149 171	166	9	2 weeks	" " " "
After 3 months.	181 170 152 170	168	3		" " " "

Case No. 248. Housewife. age 43.

Symptoms and signs of hypertension for 2 years. Main complaint was of headaches. B.P.=194/110. Previous health was good.

	Blood Sugars,	Average.	E.S.R.	Return to normal.	Insulin.
Before T.A.B.C.	206 183 174 200	191	2		Nil.
On T.A.B.C.	213 199 184 223	205	19		Nil.
After T.A.B.C.	209 194 180 209	198	7	2 weeks	Nil.
After 3 months:	203 182 172 208	191	5		Nil.

Case No. 249. Female. age 61. Housekeeper.

Diabetes for 3 years. Severe sprain of R. ankle which was at first thought to be fractured. She was overweight. She was otherwise well.

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
Before TABC:	159 164 142 153	155	4		Nil.
On TABC:	174 183 157 171	171	23		Nil.
After TABC:	163 171 149 159	161	9	3 weeks.	Nil.
After 3 mths:	153 159 152 149	153	4		Nil.

Case No. 250. Male. age 17. Farm worker.

Diabetes for 5 months. He had no other complaints apart from measles, mumps and scarlet fever in childhood.

	Blood Sugars.	Average.	E.S.R.	Return to normal.	Insulin.
Before TABC:	162 173 164 183	171	3		24 P.Z.I.
On TABC:	173 194 169 200	184	34		" " "
After TABC:	172 184 159 194	177	5	2 weeks.	" " "
After 3 month	170 165 158 179	168	4		" " "

Case No. 251. Male. age 33. Gardener.

He had a mild pyloric stenosis secondary to a duodenal ulcer. He was receiving medical treatment prior to gastro-enterostomy. His health otherwise had been good.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before TABC:	98 131 122 104 96	110	3	
On TABC:	104 153 134 120 109	124	17	
After TABC:	96 127 134 110 100	113	4	2 weeks.

Case No. 252 follows Case No. 260 at end.

Case No. 253: Housewife: age 57.

10 years history of thyroid swelling of neck but there was no evidence of thyrotoxicosis. She had no other complaint and health had always been satisfactory.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	108: 132: 146: 124: 110	124	4	
On TABC:	116: 155: 133: 129: 118	130	23	
After TABC	104: 130: 138: 114: 102	118	4	2 weeks
After 3 mths.	108: 142: 128: 112: 104	119	7	

Case No. 254. Male: age 47: shipyard worker.

Multiple sebaceous cysts of neck and head. They had been present for many years. He had pneumonia in childhood and was subject to occasional winter coughs, the last one being 4 months previously.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	98: 124: 131: 114: 92	120	7	
On TABC:	102: 154: 143: 129: 112	128	35	
After TABC:	94: 130: 124: 104: 100	110	4	3 weeks
After 3 mths.	100: 132: 122: 108: 98	112	7	

Case No. 255: Female: age 39: factory worker.

Lipoma of back for 6 years - there had not been much difference in size recently. Health had always been good.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	89: 112: 134: 108: 94	107	3	
On TABC:	104: 135: 143: 100: 99	116	17	
After TABC	88: 124: 136: 110: 99	111	7	1 week
After 3 mths.	94: 130: 124: 112: 102	112	5	

Case No. 256. Male: age 19: student.

Vague abdominal pains for 3 days. All symptoms were considered due to constipation.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	94: 116: 136: 109: 88	109	5	
On TABC:	100: 149: 143: 132: 126	130	23	
After TABC	97: 147: 132: 116: 100	118	9	2 weeks
After 3 mths.	94: 127: 139: 100: 92	110	4	

Case No. 257. Male: age 43: laundryman.

He had been involved in an accident but had escaped with severe bruising which had cleared satisfactorily.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	103: 132: 128: 112: 100	115	2	
On TABC:	123: 142: 156: 132: 118	134	39	
After TABC:	109: 142: 134: 119: 103	121	7	3 weeks
After 3 mths.	99: 129: 139: 119: 103	116	4	

Case No. 258. Housewife: age 62.

She had sustained a fracture of R. femur 8 months previously but this had not united in good position and was to be reset.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	112: 134: 146: 124:116	126	3	
On TABC:	120: 149: 159: 134: 118	136	29	
After TABC:	103: 141: 134: 118: 112	122	4	1 week
After 3 mths.	100: 134: 142: 118: 108	120	7	

Case No. 259. Male: age 53: labourer.

R. inguinal hernia for 2 years and had been admitted for herniotomy. Apart from occasional coryza, he had always been healthy.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	104: 134: 132: 116: 100	117	4	
On TABC:	112: 142: 128: 112: 108	120	24	
After TABC	108: 126: 139: 112: 104	118	6	2 weeks
After 3 mths.	100: 131: 120: 110: 104	113	7	

Case No. 260. Housewife: age 47.

R. femoral hernia for 6 years. She was overweight but admitted to no serious illness or infection.

	Blood Sugars	Average	E.S.R.	Return to Normal
Before TABC:	112: 143: 132: 118: 108	123	7	
On TABC:	121: 146: 152: 138: 120	135	26	
After TABC:	116: 129: 146: 120: 109	124	7	3 weeks
After 3 mths.	108: 134: 140: 120: 103	121	5	

Case No. 252. Housewife. age 57.

Mild digestive symptoms which were later proved to be due to a gastric ulcer. She had been subject to boils for many years but had none for the past 2 years.

	Blood Sugars.	Average.	E.S.R.	Return to normal.
Before TABC:	103 134 147 123 109	123	7	
On TABC:	121 139 154 132 129	135	29	
After TABC:	116 142 138 121 110	125	9	2 weeks.
After 3 mths:	110 141 129 114 104	120	4	