With a penicillin-insensitive strain, on the other hand, the production of acid is not susceptible to inhibition by penicillin. This is shown in Table V.

TABLE V

Final Concentration of Penicillin in Oxford Units per ml.	Presence or Absence of Clot After Varying Periods of Incubation with Penicillin-insensitive <i>Afibrinolytic</i> Strain of <i>Staph. pyogenes</i>		Colour of Contents of Tubes Before and After Incubation (0.02 ml. of 0.04% Neutral Red was Added to Each Tube)	
	3 hrs.	9 hrs.	Initially	9 hrs.
0.00	++	++	Yellow	Pink
0.025	++	++	"	"
0.05	++	++	"	"
0.10	++	++	"	"
0.25	++	++	"	"
0.50	++	++	"	"

NOTES ON TABLE V.—(1) Quantities of reagents employed were the same as in Table IV. (2) Symbols have same connotation as in Table IV.

It is seen from the above results (Table V) that even 0.5 unit of penicillin per ml. has not interfered with the production of acid by insensitive *Staph. pyogenes*, which is in marked contrast to the results in Table IV when a sensitive strain was employed. The results in Table V also demonstrate the separate nature of the phenomena of fibrinolysis and acid production. The strain used was *afibrinolytic*, and in spite of good acid production (at all penicillin concentrations used) solution of fibrin did not occur.

Fibrinolysis by *Str. pyogenes* (Group A) is also inhibited by penicillin (as was shown by Neter and Will, 1944). Using the technique described above, this action was found with one strain down to 0.025 unit of penicillin per ml., and with another to 0.0125 unit per ml. As *Str. pyogenes* does not form coagulase, 0.02 ml. of 1% calcium chloride was added to each tube to give the preliminary fibrin clot.

This inhibitory action of penicillin on fibrinolysis by both *Staph. pyogenes* and *Str. pyogenes* may be responsible for some of the therapeutic effects of penicillin, since prevention of the dissolution of fibrin barriers would counteract the spread of infection.

Summary

Penicillin inhibits fibrinolysis by penicillin-sensitive fibrinolytic strains of *Staph. pyogenes*.

The clot produced in human plasma by coagulase activity redissolves on further incubation, but fails to redissolve in the presence of penicillin at concentrations as low as those necessary to inhibit growth.

This effect is shown with penicillin-sensitive but not with penicillin-insensitive strains of *Staph. pyogenes*, and is presumably connected with the inhibition of growth.

I am very grateful to Major-Gen. L. T. Poole for his kind interest in this work, also to Major J. H. Twiston Davies, Lieut.-Col. C. H. Stuart-Harris, and Major S. T. Cowan for valuable advice. I wish to thank Sgt. J. R. McDonald and Sgt. J. Smith for their able assistance.

REFERENCES

- Bigger, J. W. (1944). *Lancet*, **2**, 400.
 Fleming, A. (1943). *Ibid.*, **2**, 434.
 — (1944). *Ibid.*, **2**, 620.
 Gengou, C. (1933). *Ann. Inst. Pasteur*, **51**, 14.
 Gonzenbach, W., and Uemura, H. (1916). *Cbl. Bakt.*, Orig., **78**, 97.
 Neter, E., and Will, D. W. (1944). *J. Bact.*, **48**, 253.
 Rammelkamp, C. H. (1942). *Proc. Soc. exp. Biol.*, N.Y., **51**, 95.
 Reimer, K. (1936). *Zbl. Bakt.*, Orig., **136**, 84.
 Smith, W., and Hale, J. H. (1944). *Brit. J. exp. Path.*, **25**, 101.
 Stuart-Harris, C. H. (1935). *Ibid.*, **16**, 513.
 Tillett, W. S., and Garner, R. L. (1933). *J. exp. Med.*, **58**, 485.
 Wilson, U. (1943). *Nature*, **152**, 475.

The *Soviet Medical Chronicle* for March, 1945, prepared by the Anglo-Soviet Medical Council in London from material supplied by the U.S.S.R. Society for Cultural Relations, Moscow, reports the reopening of the Pirogov Museum in the village of Sheremetka, not far from the city of Vinnitsa in the Ukraine. This museum is dedicated to Nikolai Pirogov, the famous surgeon (1810-81), known as the father of Russian medicine. During their occupation the Germans turned it into a stable and destroyed many valuable exhibits. When they retreated from the village the Germans planted mines both in the house in which Pirogov had lived and worked, and in his tomb. At the risk of their lives the villagers removed the mines and saved the museum. Later on the staff of the local hospital helped to repair the building, which is now open to visitors again.

Medical Memoranda

Identical Disease in Identical Twins

Kallmann and Reisner (1943), in an enlightening study recently reviewed in this *Journal* (1944, **2**, 504), confirmed the conclusions arrived at by various other authors that "hereditary factors play a decisive part in both the origin and the clinical course of tuberculous disease." An extensive literature—mostly German—on this subject is to be found in the original paper.

As a contribution to the pathology of twins the following cases may be of some interest.

The twins in question are 7-year-old daughters of a tuberculous mother under my treatment. These little girls, so far as I am able to judge, are identical—monozygotic—twins. In the course of routine contact examination of the children I learnt that they were complaining of cramp-like abdominal pains. The plain abdominal radiographs of the twins show calcified mesenteric glands,

so alike in size, site, and configuration that one feels entitled to call them identical. As the two radiographs were taken on different days some allowance should be made for a slight difference in positioning, with slightly different projection of the glands in relation to the spine. There is no doubt that in both cases exactly the same group of glands is affected.

E. G. W. HOFFSTAEDT, M.D. Berlin,
 Consultant Tuberculosis Officer, W.R.C.C.;
 Clinical Tuberculosis Officer, Doncaster.

REFERENCE

- Kallmann, F. J., and Reisner, D. (1943). *Amer. Rev. Tuberc.*, **47**, 549.

Diffuse Peritonitis from Gangrene of Hernial Sac

Gangrene of a hernial sac, though rare, is well known. It may or may not be associated with gangrene of the sac contents, the latter usually occurring in an elderly patient with a long-standing hernia. However, the following case, if not unique, appears to be of such rarity as to be worth recording.

A man aged 59 was admitted to the City General Hospital, Sheffield, on Nov. 15, 1944, for retention of urine. The relevant history was that six months previously he developed bilateral inguinal herniae, for which he was given a truss. This did not control either side adequately, and 10 days before admission the left hernia became irreducible, painful, and tender. This local tenderness was followed by colic pain, nausea, and later vomiting, also with absolute constipation for four days and retention of urine 12 hours before admission, for which he had been catheterized.

On examination his general condition was poor, he was dehydrated, and his tongue was red and dry. The abdomen was distended, tender all over, but intestinal sounds were present. In the left inguinal canal there was a tender swelling, which was irreducible, non-expansile on coughing, and covered by red oedematous skin. Seven oz. of urine was withdrawn by catheter. The provisional

diagnosis was strangulated omental hernia with abscess formation and early peritonitis. Operation was immediately performed under local analgesia. Pus was found under the skin around and in the hernial sac, which was gangrenous, though the omentum, the only contents of the sac, was viable. The pus within the sac was aspirated, but on displacing the omentum pus welled out from within the abdomen. The sac was excised and the viable peritoneum at the internal ring closed. The skin was loosely sutured, with drainage to the peritoneum. He was given morphine, and an intravenous drip was inserted, but death occurred some 27 hours later.

Necropsy showed diffuse suppuration in the left inguinal canal and acute diffuse peritonitis, starting from the region of the left internal abdominal ring. No cause for the lesions was found, as the gut and omentum were viable and the gangrenous sac had been excised at operation.

I wish to thank Dr. Rennie, M.O.H., and Dr. Clark, medical superintendent, for permission to publish this case.

JUDSON T. CHESTERMAN, M.R.C.P., F.R.C.S., F.A.C.S.

Sheffield.

A Case of D.D.T. Poisoning in Man

Extensive studies on the toxicity to mammals of the new insecticide, 4,4'-dichlorodiphenyl-trichlorethane, commonly known as D.D.T., have shown that this substance is primarily a nerve poison, producing excitability, muscular tremors, clonic convulsions, and finally paralysis and death. It also causes a leucocytosis, anaemia, changes in blood calcium, and fatty degeneration in the liver and kidneys. It is absorbed readily through the skin, particularly when dissolved in kerosene (Cameron, 1943; Domenjoz, 1944; Draize *et al.*, 1944; Lillie and Smith, 1944; Neal *et al.*, 1944; Nelson *et al.*, 1944; Smith and Stohlmán, 1944; Woodard *et al.*, 1944). In spite of a careful search among persons who have handled D.D.T. over long periods, no instance of poisoning in man has so far been reported. It seems desirable, therefore, to put on record the following case.

CASE HISTORY

The subject was a laboratory worker, about 30 years of age, in perfect health. Being unaware of the risk of absorption through the skin, leading to a general intoxication, and being anxious to discover whether D.D.T. was liable to cause any local irritation, he deliberately allowed small quantities of an acetone solution (acetone is one of the best solvents for D.D.T.) to evaporate on the back of the hand, the residual deposit being swabbed off with cotton-wool soaked in acetone. No erythema or any kind of skin irritation was observed. At least one further and more complete exposure was carried out, during which the subject's hands were in prolonged contact with the compound in acetone solution. In the course of these experiments an acetone solution containing about 25 g. of D.D.T. was added to an inert dust and the mixture kneaded with the hands for some minutes. During this operation the mixture completely covered the hands almost to the wrists. When the hands were taken from the mixture the solvent rapidly evaporated, leaving a dry deposit on the skin, which was removed as before by swabbing with acetone.

From one to ten days later a feeling of heaviness and aching developed in all the limbs, with weakness in the legs. There were also what the subject described as "spasms of extreme nervous tension." There was some improvement during a holiday taken at this time; but on returning to work the condition deteriorated, and some three weeks later the perpetual aching in the limbs confined the patient to bed. Sleep became almost impossible, the feeling of extreme nervous tension became more frequent, and a state of acute mental anxiety developed.

About six days after being confined to bed involuntary muscular tremors occurred over the whole body, and these were experienced on at least two subsequent occasions. After 10 to 14 days the patient got up, although the aching in the limbs was still severe. His recovery was very slow. He was away from work for 10 weeks in all, but even at the end of a year recovery was not quite complete.

During his illness it occurred neither to the patient nor to the neurologist and others whom he consulted that this might be a case of D.D.T. poisoning. Anxiety occasioned by the mysterious nature of his complaint was probably the cause of some of the symptoms (which are not here recorded); his condition immediately began to improve when he realized that his was almost certainly a case of poisoning by D.D.T.

The general consensus of opinion, based on experiments with animals and observations on man, is that D.D.T. used with discretion does not constitute a hazard to human health. The case here recorded is the exception which tests the rule. Symptoms closely resembling those seen in animals developed only after a deliberate exposure to D.D.T. far in excess of anything that would be likely to occur in practice.

London School of Hygiene
and Tropical Medicine.

V. B. WIGGLESWORTH, M.D., F.R.S.

REFERENCES

- Cameron, G. R. (1943). (Unpublished work.)
Domenjoz, R. (1944). *Schweiz. med. Wschr.*, **74**, 952.
Draize, J. H., Nelson, A. A., and Calvery, H. O. (1944). *J. Pharmacol.*, **82**, 159.
Lillie, R. D., and Smith, M. I. (1944). *Publ. Hlth. Wash.*, **59**, 979.
Neal, H. A., *et al.* (1944). *Ibid.*, Suppl. No. 177.
Nelson, A. A., *et al.* (1944). *Ibid.*, **59**, 1009.
Smith, M. I., and Stohlmán, E. F. (1944). *Ibid.*, **59**, 984.
Woodard, G., Nelson, A. A., and Calvery, H. O. (1944). *J. Pharmacol.*, **82**, 152.

Reviews

THE NATURE OF COURAGE

The Anatomy of Courage. By Lord Moran. (Pp. 216. 8s. 6d.). London: Constable and Co.

Lord Moran served as medical officer with one of our finest infantry battalions in the last war, and kept a diary in which he wrote of the minds and behaviour of men under stress of battle—studies which reveal his remarkable powers of observation and description. Extracts from the diary are interwoven in this book with present reflections enriched by the author's contact during this war with statesmen and officers of high rank in the fighting services—men who are interested as he is in the vital problem of morale. Wars are won, Lord Moran reminds us, by the courage and endurance of the few who are like rafts to which all the rest of humanity clings for support and for life. It is they who set the standard for victory. Fear is the enemy in himself with which a man must ever contend, and must vanquish if he is to play his part in the issue of success. This secret battle the author watched in the officers and men of his battalion, and in himself, through the vicissitudes of three years from the high-spirited days of 1914 to the last weary trench winter of 1917. He writes of the discovery of fear in men of all sorts, appearing in ways which are as many and various as their personalities, of fearlessness, of the ebb and flow of courage, and of the care and management of fear. His pages are alive with vivid intimate sketches of men seen at their critical moments of opportunity for success or failure in the venture which, as he says, is now not as of old the trade of the mercenary or the lot of the unimaginative, but the ordeal which every citizen must expect, whatever the stuff he is made of and whatever may be his attitude towards war. It is an ordeal which has borne hardly upon some of those brought up between the two wars to regard war as a senseless folly which solves nothing.

This book makes good reading, but critically regarded it lacks order and aim, and the reader who looks for deep and original thought may be disappointed. The distinction between war neurosis and concussion is dealt with in a way which might lead the uncritical to suppose that the blast effect of a shell may be responsible for the former—the hypothesis of shell shock abandoned in the last war and unsupported in this—and the assumption is made that a man may become an epileptic as the result of emotional strain. These are minor blemishes in a volume which is full of good stories and crisp thought, but are none the less unfortunate. The final chapter, on leadership, shows the author at his best and reveals his wide knowledge of military history. The book, one hopes, will be read by all medical and commanding officers of combatant units, for it cannot fail to excite thought and advance inquiry into the means of keeping the soldier's mind fit for his job—a task which is now widely recognized as the joint responsibility of commander and doctor.

A PRIMER OF SOCIAL MEDICINE

A Handbook of Social Medicine. By Fred Grundy, M.D., D.P.H. (Pp. 172; illustrated. 8s. 6d.). Luton: The Leagrave Press. 1945.

Dr. Grundy has written this book on social medicine to help midwives in their studies as hospital pupils, and in their practice. The matter it contains is an expansion of his own lectures to pupil midwives. As an aid to study and practice it ought to be useful not only to midwives but also to other nurses in the social health services.

The subjects dealt with cover many wide fields of knowledge and practice, but of course they are handled very briefly for the special needs of the readers. The sections deal in turn with the administrative structure of the socio-medical services, central and local; with the individuals concerned, women and children, in their environment; with the relevant problems of infection; with social biology and vital statistics; and provide a historical sketch of midwifery, an account of the Midwives Acts, and a useful extract from the Rushcliffe Committee report.

There can be no question that if the midwife is to be really competent and interested in her clinical practice she requires