dysfunction, and recent infection. Pregnant and nursing mothers were also excluded.

The apparatus used for the dark-adaptation test was that described by Yudkin (1941b), with the addition of a means of stabilizing the voltage. The procedure was as follows:

Method.—Each subject was generally examined as indicated above, and the test explained and demonstrated. They were put into the dark-room at 10-minute intervals. Before entering the dark-room no subject had been in the hospital less than half an hour, to safeguard against the effects of exposure to previous high brightnesses (Craig and Vernon, 1942). At the end of the first subject's 30 minutes' dark-adaptation time the test was made, and so on with the remainder at 10-minute intervals. By this arrangement the intervals between subjects entering the dark-room and being tested were balanced so that all were dark-adapted for 30 minutes. The test object (arrow) was first shown at a brightness which could be seen fairly easily, and the brightness decreased until the threshold reading was obtained. The test was then continued to 40 minutes. As under the conditions of the test the expected difference between the readings at 30 minutes' and 40 minutes' dark-adaptation time is not more than 0.1 μlog unit, subjects showing greater amounts than this were re-tested. In addition all readings of 3.83 μlog units and over were confirmed. The threshold measurements of brightness seen at 30 minutes' dark-adaptation time expressed as $\log \mu\text{log}$ were those taken.

The measurement of dark-adaptation by means of such "final" threshold measurements, while not yielding the same amount of information as can be obtained by a "full" test, is nevertheless the most useful single measurement which can be taken (Yudkin and Robertson, 1943), since it has been shown that the threshold measurements at 30 minutes' dark-adaptation time are always affected if dark-adaptation has been impaired through lack of vitamin A. The results are shown in Table II.

TABLE II

	Total No.	Threshold Reached, $\log \mu\text{log}$, at 30 minutes, D.A. Time							Mean Threshold $\log \mu\text{log}$
		3.40	3.53	3.72	3.84	3.93	4.01	4.14	
Skin cases	103	8	45	32	10	2	5	1	3.679
Controls	101	8	36	39	14	1	2	1	3.683

Comment

There is thus no significant difference between the mean threshold values of the two groups. The values obtained seem to be rather high (cf. Yudkin, 1941c), although these absolute values should be accepted with some reserve, as the standardization of the instrument has not been checked for some time.

Two cases of particular interest appeared in the skin group—one a case of Darier's disease and the other a case of pityriasis rubra pilaris; the latter, which has been fully reported elsewhere (Porter and Godding, 1945), responded to vitamin A therapy, and good correlation was established with the dark-adaptation results. The former will be discussed along with other cases of Darier's disease in a further paper.

Summary

A dark-adaptation test revealed no significant difference between a group of skin cases and a group of controls.

It is highly probable that with the safeguards applied the results indicated a similarity in vitamin A nutritional status between the two groups.

We have to acknowledge with thanks the co-operation of the board of management and administrative staff of the Royal Dental Hospital in providing the facilities which enabled us to carry out the tests on the control group; and to thank the Crookes Laboratories for the loan of the dark-adaptation apparatus and for generous supplies of vitamin A.

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Medical Memoranda

Tubercle Bacilli and Urea

In the *Journal* of May 16, 1942 (p. 609), I recorded in a short paper the bactericidal action of urea in saturated solution on an equal volume of a strong suspension of human tubercle bacilli in distilled water—the resulting mixture containing, of course, a half-saturated solution of urea. In July, 1944, I had the pleasure of receiving a letter from Dr. R. M. Humphreys, late senior physician, Sudan Medical Service, stating that he and his assistant, Dr. Abdel Halim of the Khartoum Civil Hospital, had had good results in treating a local civilian with (a) dry powdered urea on the skin ulcerations resulting from infection of the needle-tracks from a tuberculous pyopneumothorax, and (b) the use of a half-saturated urea solution as a replacement fluid in the same patient. The ulcers healed quickly under the urea powder, and the fluid, after eight removals, washings-out with sterile saline, and replacement with 300 c.cm. of half-saturated urea solution, became at last completely sterile for tubercle bacilli. It is to be noted, too, that the washings of the first fluid introduced, though found to contain many acid-fast bacilli, were sterile from the point of view of culture.

This communication recorded such favourable results and seemed so much what I had expected that I decided to make a few more experiments with urea; these are here set forth:

Three cultures—human, bovine, and avian—were obtained from the National Collection of Type Cultures, and subcultures were put up with saturated urea solution, the method being identical with that previously described. In the course of a month all three exposed to the saturated urea solution remained apparently sterile. There was a growth of tubercle bacilli on the "second dilution" capsules, except in the case of bovine tubercle, and in all lesser concentrations. The controls, of course, grew well. At a subsequent subculture from the apparently sterile capsule of human tubercle bacilli a very small growth was obtained—a fact which led to a further trial with the use of a more carefully saturated urea solution. On this further trial the saturated solution + t.b. was typically negative for tubercle bacilli both on the original capsule and on subculture.

It would seem that strains of tubercle bacilli vary somewhat in their sensitivity to urea. It may be added that the fluids containing saturated urea and t.b. and the controls containing only t.b. were inoculated into guinea-pigs and that *neither* animal developed tuberculosis. This is curious, as the "control" was positive and should have killed. The strain is being further investigated.

With the assistance of Major Elliott, chemist at the R.A.M.C. College Laboratories, and Cpl. Johnson, R.A.M.C., I made the following further observations: (1) Saturation point is reached with approximately 92.3 g. of urea to 100 c.cm. of distilled water at 19° C. (2) Saturated urea has a pH of about 6.8 (brom-cresol-purple). (3) The mould *Penicillium notatum*, suspended in saturated urea, was apparently unaffected. (Control in saline.) (4) A suspension of tubercle bacilli in half-saturated urea solution was divided into two parts. Half was subjected to dialysis, half not, and the two were compared after 48 hours. The result was: undialysed portion, 55.2 g. of urea per 100 c.cm.; dialysed portion, 0.013 g. of urea per 100 c.cm.

It would appear, then, that a strong suspension of tubercle bacilli, killed by 48 hours' contact with a saturated solution of urea, can be freed of urea by dialysis and retained as a dead bacterial suspension for any purpose required.

My thanks are due to Dr. R. St. John Brooks of the National Collection of Type Cultures; to Col. F. S. Irvine, C.M.G., D.S.O., commandant of the R.A.M.C. College; to Lieut.-Col. W. R. M. Drew, Professor of Tropical Medicine; and to Major W. A. Young, Major Elliott, and Cpl. R. I. Johnson, R.A.M.C., for invaluable help.

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Recurrent Ectopic Gestation on the Same Side as Previous Salpingectomy

The case reported here may be found to be of interest not only because of its rarity but also because, if the possibility of recurrence is recognized, the chances of this unfortunate accident occurring may be lessened at the first operation.

CASE HISTORY

The patient, a woman aged 35, her occupation at the time being welding, was admitted to Tilbury Hospital on April 3, 1944, complaining of lower abdominal pain. The time of onset had been 4 days before; the pain had later become less severe, but on the day of admission had returned with increased intensity. The date

of the last menstrual period was Feb. 4, 1944; there had been no vaginal bleeding of any kind since then. Her periods were regular, usually lasting 7 days every 28. She had three children—the youngest 10 years of age—and had suffered from a vaginal discharge previous to the birth of this child.

The history was that the patient had been admitted to the same hospital on Aug. 24, 1933, and operated on for an ectopic gestation on the left side. At the operation she was found to have a pelvic haematoma, with a mass surrounding the left tube and ovary; the left tube and ovary were removed. Recovery was uneventful.

When examined on the present occasion the patient was quite pale; pulse 100, temperature 97.6°, blood pressure 75/60; chest N.A.D. The abdomen was slightly distended, with some rigidity of the lower part and marked tenderness, especially in the left iliac fossa. On vaginal examination there was a muco-purulent discharge but no suspicion of blood. The cervix was lacerated and somewhat soft. The fornices were extremely tender, but the shape and size of the uterus could not be made out owing to abdominal tenderness and rigidity. A tentative diagnosis of ectopic gestation was made, but owing to the patient's history it was decided to watch her for a short period. As after two hours the pulse rate was rising, operation was decided upon, intravenous plasma being given beforehand. Nitrous oxide, oxygen, and ether anaesthesia was employed. The old infra-umbilical scar was excised and the abdomen opened. The pelvis was full of clotted blood. On examination of the uterus the left tube and ovary were found to be absent; the uterus was the size of a 6 to 8 weeks pregnancy. The left cornu of the uterus was eroded and in fact ruptured during the handling of the organ, extruding a small foetus, age 6 to 8 weeks. Owing to the size and nature of the rupture it was found necessary to perform a subtotal hysterectomy. The patient's recovery, apart from a mild tonsillitis, was uneventful, and she was discharged on April 26. Examination of the uterus showed an ectopic pregnancy arising in the intramural portion of the tube that had previously been removed.

Comment

Although cases of recurrent ectopic gestation are relatively common, the literature on the subject reveals very few cases in which the extra-uterine pregnancy has recurred on the same side, and still fewer in which the recurrence followed salpingectomy on the same side. Wetterwald's (1927) case did not have the tube removed in the first instance, and in the case reported by Bracht the recurrence was in the ampullary portion of the tube. Bello *et al.* (1929), Saass (1930), and Nizza (1933) all reported cases of ectopic gestation recurring on the same side as previous surgical intervention, and Scipades (1934) recorded a case of recurring tubal pregnancy on the same side as previous surgical intervention, with a living child born at term. Apart from these examples this type of case appears to be a very rare form of accident.

I would like to thank the staff of Tilbury Hospital for their help in compiling this case report.

Tilbury.

SIDNEY GEE, M.B., B.S.

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JOINT TUBERCULOSIS COUNCIL

The Joint Tuberculosis Council, at its last meeting, discussed several matters of interest to the tuberculosis world. On the recommendation of the Joint Education Committee (upon which the Council and the National Association for the Prevention of Tuberculosis are represented), the Council approved the draft constitution for a Tuberculosis Educational Institute. This institute will arrange courses, lectures, and demonstrations for the education of doctors, nurses, almoners, and social workers in tuberculosis. It will, it is hoped, act as an information centre in all matters connected with tuberculosis education, and will recommend candidates for N.A.P.T. scholarships. The institute will suggest lines of research in tuberculosis, and will generally facilitate and encourage the study of the subject in Great Britain by visitors from over-seas. It will work in co-operation with university postgraduate centres and will give them all possible assistance. The Joint Education Committee also recommended the N.A.P.T. to award two £50 scholarships for health visitors, and two scholarships of similar amount for student almoners. The Council's Committee on Reorganization of the Tuberculosis Services (which at this meeting was renamed the Committee on Development of the Tuberculosis Services) was asked to consider and report upon the present situation in relation to the proposal National Health Service (with particular reference to the recent negotiations between the Ministry of Health and the B.M.A.). The Council decided to approach the Spens Committee with representations that tuberculosis clinicians should be dealt with, in any scheme of salary revision for practitioners engaged in public work, on the same basis as specialists in other branches of medicine.

Reviews

ARTHRITIS AND ALLIED CONDITIONS

Arthritis and Allied Conditions. By Bernard I. Comroe, M.D., F.A.C.P. Third edition, enlarged and thoroughly revised. (Pp. 1,359; illustrated. 60s.) London: Henry Kimpton.

The arrival of a third edition of this important work within five years of its first appearance is ample testimony to the place it has gained in the literature of rheumatic diseases. Advantage has been taken to rewrite some chapters and to bring the whole up to date, and a good deal of fresh matter has been added, increasing the 750 pages of the first edition to 1,359 in this one. The needs of the general practitioner have been studied and a new chapter presents a diagnostic digest of the average arthritic problem; there is also a new chapter on treatment in general practice, while the valuable feature of the first edition of presenting summaries in "box form" so as to be easily available to the individual with little time for reading is preserved.

The sulphonamides are dealt with in the light of the most modern knowledge, and a chapter on penicillin has been added, though its use in arthritic conditions appears to be limited. The chapter on massage has been enlarged with very helpful illustrations, while other forms of physiotherapy are fully described, enabling the practitioner to prescribe exactly what he wishes to be done instead of leaving it to the masseuse, as is so often the case. One of the most striking features is a chapter on mistakes in the diagnosis and handling of patients with arthritis and allied conditions, which will be read with profit by the most experienced workers in this branch of medicine. The possible mistakes number 238, a formidable array, and it is a temptation to quote some of the most striking; but one deserves the attention of our rulers and governors whose attention may be drawn to it, since it is unlikely that they will come across it otherwise. "Mistake 63 is the lack of sufficient funds for investigative work and lack of adequate hospital facilities for the care of arthritic patients." It is pointed out that in the U.S.A. there are not more than 200 free beds for rheumatic cases as compared with 100,000 for tuberculosis, though arthritis and allied complaints are more common than the sum of all tuberculosis, cancer, diabetes, and heart disease.

HUMAN AND ANIMAL PARASITOLOGY

Introduction to Parasitology. With Special Reference to the Parasites of Man. By Asa C. Chandler, M.S., Ph.D. Seventh edition. (Pp. 716; illustrated. \$5.00 or 30s.) New York: John Wiley and Sons; London: Chapman and Hall.

This book has grown considerably since its original appearance over twenty-six years ago. Its title has been changed several times to meet its increasing scope, and now it reaches the seventh edition four years after publication of the sixth. The book is thoroughly up to date, and anyone who wishes to obtain a comprehensive view of human and animal parasitology can hardly do better than secure a copy and read it carefully from cover to cover. The author has kept himself informed of the many advances in knowledge in the fields of protozoology, helminthology, and entomology which have been made during the war, and has incorporated all of them. Thus, to name only three of the new additions, mention is made of the trypanocidal action of aromatic diamidines, of the successful transmission of lishmania infections by the bite of sandflies, and of the remarkable insecticidal properties of D.D.T., particularly with reference to its effect on the louse and the influence this has on the spread of typhus fever.

The main descriptions in the book relate to the parasites of man, but sufficient information is given of parasites of animals to make it of use to veterinarians as well as to medical men. Short accounts of spirochaeta, rickettsia, and virus diseases are included. There are no coloured plates in the book, but the black-and-white illustrations, of which there are over 300, are adequate. Systems of classification are not over-emphasized, and when inserted are in smaller type arranged in such a way that they can be disregarded by the reader who is not particularly interested in this branch of the subject. It seems unnecessary to say anything more about the work. It is a good one which can be thoroughly recommended.