preferable to lethane because one treatment properly carried out should cure every case. This substance will not, however, be available till after the war. Lethane will cure a large proportion of cases with one application, but two treatments at a week's interval will give certain cure. In order to obtain good results the details of the application of lethane should be carefully observed. Two or three teaspoonfuls of the oil are used for one treatment. The hair is parted, and 2 or 3 drops from the teaspoon or pipette are dripped on to the scalp. This is repeated in from 12 to 20 different areas all over the scalp. With the finger-tips the scalp is vigorously rubbed for two minutes to ensure equal distribution of the oil. Any oil which trickles down the forehead or behind the ears should be wiped off with cotton-wool and vaseline applied.

The following substances proved ineffective in the treatment of pediculosis: 20% solution of dettol, derbac soap, concentrated infusion of quassia, 12.5% formalin soap mixture (M.O.H. Memo., 1940), 0.1% aqueous solution of mercuric chloride, oils of cedar-wood, citronella, and lemon-grass, and lauryl thiocyanate.

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LOCAL EFFECTS OF INTRAMUSCULAR INJECTION OF SOLVOCHIN*

BY

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Solvochin is a soluble preparation of quinine, designed for intramuscular injection and supplied by the Camden Chemical Co. Ltd. According to Cooke and Wingfield (1944), 2 c.cm. contains $7\frac{1}{2}$ gr. of quinine base together with phenazone. The reaction is pH 7.2. It has been recommended by Cooke and Wingfield (1944) and others for the treatment of malaria, on the ground that intramuscular injection is painless; some hundreds of injections were given by these observers without any serious complication, although a tender inflammatory induration was once noted.

The present investigation was undertaken to study the action of this preparation upon the tissues at the site of injection and to compare it with those of mepacrine and of quinine dihydrochloride (Hawking, 1943, 1944). The technique was the same as that used in the previous studies. The solution in the ampoule of solvochin was diluted with sterile isotonic saline, 1 c.cm. being made up to 7.5 c.cm., so that 0.5 c.cm. contained 16.3 mg. of quinine base. This corresponded to 20 mg. quinine dihydrochloride in 0.5 c.cm. injected during previous studies (Hawking, 1944). Injections were made intramuscularly into the thighs and loins of rabbits and also subcutaneously on the abdominal wall. Altogether 14 intramuscular injections were made and 4 subcutaneous ones. Two control injections with 0.5 c.cm. normal saline were also made intramuscularly; no sign of local injury due to these control injections was found. The animals were killed after 1 to 8 days. The site of injection was inspected macroscopically, and pieces of tissue were fixed in formol-saline and studied by the usual histological methods, staining with haematoxylin and eosin and with haematoxylin and van Gieson.

Results

Macroscopic Appearances.—In the muscles of the loin there was a dark-red fusiform mass (necrosis) with a narrow yellow border (leucocytic reaction); typical dimensions were 3 cm. by 0.9 cm. by 0.6 cm. In the thigh the picture was more varied. In some cases there was a dark-red mass 2 by 1 by 0.8 cm. lying longitudinally in the surface of the muscles along the sciatic nerve; in other cases there were small punctate haemorrhages, or the surface of the muscles appeared whitish and roughened. The muscles of the rabbit's thigh are divided by many planes of loose connective tissue, and solutions injected into the thigh are usually distributed along these planes,

between the muscles rather than inside them. In the loin the muscles form a compact mass, and solutions injected are confined to the interior of the muscle. At the site of subcutaneous injection there was no macroscopic evidence of tissue reaction.

Histological Appearances.—In the loin there was an area of coagulative necrosis with variable amounts of haemorrhage as described above. At the margin of this area there was a fairly thin zone (1 to 2 mm.) of leucocytic reaction. On the first day after injection many of the leucocytes were polymorphs, and fibrinous fluid was sometimes present; after 5 to 8 days most of the leucocytes were large mononuclears, and granulation tissue with fibroblasts was present. After 8 days some of the necrotic muscle fibres were becoming calcified. In the thigh the amount of necrosis was variable. In some slides there were long areas of necrosis and haemorrhage as described above. In others the necrosis was limited to the superficial layers (2 to 6 fibres deep) on the surface of the muscles. Adjacent muscle fibres were shrunken and basophilic. The neighbouring connective tissue was moderately distended with fluid and lightly infiltrated by leucocytes. After 8 days granulation tissue was present. In the skin there was necrosis of the subcutaneous layer of muscle for a short distance, and in one case there was necrosis of the epithelium over a small area. The adjacent connective tissue showed a little fluid and a few leucocytes (small round cells).

Discussion

The lesions produced by the injection of solvochin containing 16.3 mg. of quinine base were indistinguishable in extent from those caused by the injection of a corresponding amount of quinine dihydrochloride, as seen in the previous study (Hawking, 1944).

Summary

Solvochin was injected intramuscularly and subcutaneously into rabbits. Necrosis of the muscle was caused at the site of injection. The lesions were indistinguishable in character and extent from those caused by the injection of a corresponding amount of quinine dihydrochloride.

Acknowledgments are due to the Camden Chemical Co. Ltd. for kindly supplying the solvochin used, and to Mr. F. J. Higginson for the histological preparations.

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Medical Memoranda

Foreign Body in Lung for Thirty-one Years

This case is published not only for its own interest but to reinforce a plea for the more frequent use of the bronchoscope in diagnosing intrathoracic lesions. The passage of a bronchoscope involves comparatively little disturbance to the patient and can almost invariably be done under local analgesia. The presence of even gross sepsis is therefore no contraindication.

CASE REPORT

A man aged 67 was admitted to the West Norfolk and King's Lynn General Hospital under Dr. Holmes Watkins on Oct. 27, 1943. There was a history of old tuberculosis of the lung, but he had been quite well for many years. On Sept. 22 he began vomiting dark fluid, and a barium meal showed a large atonic stomach, but no evidence of ulcer or neoplasm. Screening of the chest revealed what appeared to be a cavity at the right base, and a skiagram showed a large patch of pneumonitis there. A profuse purulent sputum grew *Str. viridans*, pneumococci, and *Micrococcus catarrhalis*. No tubercle bacilli were seen.

On Nov. 3, at Dr. Watkins's request, I undertook a bronchoscopy. Premedication was by omnopon and scopolamine, and in addition he was given an amethocaine hydrochloride pastille to suck 20 minutes beforehand. Under cocaine analgesia the bronchoscope passed quite easily, and when it entered the right bronchus a well of pus was seen. This was aspirated and a dark foreign body was seen lying across the bronchus about 4 cm. down from the bifurcation of the trachea. It was removed without great difficulty and found to be about three-quarters of an inch of the vulcanite mouthpiece of a pipe.

Questioned subsequently, the patient recollected an accident in 1912, when he fell from his bicycle and his pipe was broken in his

* A report to the Malaria Committee of the Medical Research Council.

mouth. His palate was lacerated at the time but healed well, and he had never thought any more about it. Unfortunately, infection in the lung spread rapidly, and he died on Nov. 15.

The astonishing thing is that a foreign body of this size could have remained blocking the bronchus for 31 years without giving rise to serious trouble. It is possible that this may be due to the fact that the airway through the centre of the vulcanite had remained patent and that he was therefore able to get enough air backwards and forwards through it to ventilate his lung. Careful examination of the vulcanite showed no corrosion or disintegration at all.

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Recurrent Dislocation of Ankle due to Rupture of External Lateral Ligament

It is still a fact that many cases of recurrent dislocation of the ankle due to a rupture of the external lateral ligament pass undiagnosed and untreated. Such a case usually presents itself with a history of a recent sprain. On examination the ankle is swollen, bruised, and painful. However, on questioning, the patient admits having had previous sprains of varying severity. On the other hand, the case may present itself with a history of recurring slight sprains and a general feeling of weakness in the ankle-joint.

The outstanding fact in the history of a case of ruptured external lateral ligament is an original injury of some severity. Further examination of the ankle does not elicit any more inversion than is found in a normally sprained ankle without a ruptured external ligament. Straight radiographs, both lateral and antero-posterior, show no evidence of the ruptured ligament. For this to be demonstrated the muscle spasm has to be relieved by an injection of novocain on the outer aspect of the joint. The result is as shown in the accompanying radiograph (Fig. 1).

A Suggested Operation

The only treatment for an ankle with a rupture of the external lateral ligament is operation. The following technique was devised by me.

At operation the old rupture is quite apparent. The ligament is repaired by splitting the tendon of the peroneus longus from above downwards. The detached end is then threaded through the external malleolus and through the os calcis (Fig. 2). The value of this method is that it is easy to per-

FIG. 1

FIG. 2

FIG. 1.—Radiograph showing dislocation of the astragalus.

FIG. 2.—Diagram showing half of the peroneus longus tendon threaded through the external malleolus and the os calcis, and back again on itself.

form and that it reconstitutes the ligament. At the same time no muscle is damaged, as the remaining half of the tendon hypertrophies.

The radiograph shown is that of a patient upon whom I operated. When first seen she was aged 32. On examination she had what appeared to be a severe sprain or a fractured ankle. Her history, however, revealed that this occurred every few months. She also clearly remembered a severe sprain as a child. This undoubtedly was the time that the ligament was ruptured. Operation revealed the old tear of the ligament. The patient has had no further trouble since the operation.

I should like to thank Mr. A. T. Fripp, F.R.C.S., as it was while assisting him at one of his cases that I devised this operation.

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Reviews

SOCIAL WORK FOR THE TUBERCULOUS

Social Work for the Tuberculous—A Practical Guide. By Harley Williams, M.D., and Irene Harbert. (Pp. 153. 5s.) London: National Association for the Prevention of Tuberculosis.

The presentation of information on social work, in any of its many forms, in a concise and readable manner, is a difficult task, and that side of it devoted to tuberculosis is no exception to the rule. The authors of this book are therefore to be congratulated on having produced a valuable guide containing a storehouse of useful knowledge in so small a compass as 153 pages. The title of the book is a little ambiguous, but the subject-matter is for the most part a clear and well-constructed summary of the management of the tuberculous patient in his home and gives an excellent account of the assistance which is available under Memorandum 266T and the help provided by care committees. It is agreed that "if its principles and ideals are grasped the care worker will be more confident in her own judgment."

In detail, however, there are some points which need correcting and revision. Where the book touches on clinical matter there is a certain degree of confusion, and in some places it gives rather misleading information. For instance, a positive skin test does not always mean there has been contact with an open case of pulmonary tuberculosis: it may result from drinking infected milk. It would have been useful to have more information on the subject of pensions and the help given by the British Legion in this direction. There is a tendency to draw a too optimistic picture of the assistance which the tuberculous patient will receive under the Ministry of Labour and National Service rehabilitation scheme, and there is little guide as to the employment of the "open case" except in the village settlements. Certain paragraphs will no doubt be redrafted in future editions, for this book will be helpful to social workers for many years to come.

A useful index to agencies for personal aid is given at the end of the book as well as a general index. The well-defined and clear font of type makes the text easy and pleasant to read without fatigue.

INDUSTRIAL OPHTHALMOLOGY

Industrial Ophthalmology. By Hedwig S. Kuhn, M.D. (Pp. 294; illustrated. 32s. 6d.) London: Henry Kimpton. 1944.

Industrial ophthalmology is not synonymous with a study of industrial eye injuries any more than ophthalmology in general is merely the study of the causes of blindness. Different occupations require different degrees of visual acuity, stereopsis, muscle balance, adequate illumination, and capacity for quick visual judgments. Furthermore, different industries involve varying degrees of ocular fatigue, and danger of damage from mechanical or toxic factors. The conditions under which some industrial processes have to be carried out may be so trying that special measures are needed to enable the worker to see clearly and comfortably for prolonged periods. Studies on these and kindred aspects have appeared in the periodical press and in monographs, but there is no systematic survey of industrial ophthalmology as a whole. It is perhaps also no exaggeration to say that there is as yet no comprehensive formulation of the problems.

The appearance of Dr. Hedwig Kuhn's *Industrial Ophthalmology* is therefore a welcome portent, for here at last is an attempt to survey the field as a whole. The numerous photographs of factories, workrooms, and machines, and of workers concentrated on particular tasks are in themselves a substantial contribution to the formulation of the problems of industrial ophthalmology. Incidentally they also show how much has been done in isolated factories, here and there, to meet some of the problems. The chapter devoted to eye protection shows forcibly enough that this is not merely a matter of goggles; like all general remedies goggles tend to conceal more dangers than they have overcome. The introductory chapter, with its stress on the need for tests to eliminate those who are visually unfit for particular tasks, is particularly illuminating; to most ophthalmologists the whole concept and