by the removal of live parasites. The names of these children with scabies were reported to the School Medical Service, which took action regarding their treatment. Immediately after examining each child a quantity—approximately 1 c.cm.—of benzyl benzoate was placed on the palm of one hand, and this was rubbed into both hands and wrists without delay. This was repeated at approximately fortnightly intervals for twelve visits. Unfortunately for the possibility of assessing the experimental results in a simple manner, whenever a case of scabies was found it was necessary for it to be reported, and the child was excluded from school for treatment. This meant that the falling incidence might be due to two causes—either the action of the benzyl benzoate on the hands and wrists or the exclusion of chronic cases of scabies and the treatment of their families by the local health authorities. To try to get over this difficulty a “control” group of children was selected. Here the fortnightly inspections were made and infected children were excluded from school, but no prophylactic benzyl benzoate was used.

The results of this investigation, which incidentally necessitated over a quarter of a million individual examinations, are summarized in the accompanying Table. It will be seen that the incidence was reduced very considerably in every group.

Table showing Results of Visits and Treatment on the Incidence of Scabies

District	Number of Children Examined	Incidence of Scabies (%)		Final Incidence as Percentage of Original
		First Visit	Twelfth Visit	
(a) Benzyl Benzoate applied to Hands and Wrists				
County borough (industrial) ..	9,962	1.48	0.23	15
Borough (industrial and mining) ..	2,526	2.57	0.71	28
“ Rural ” district (mainly mining)	536	2.10	1.13	54
(b) No Benzyl Benzoate applied				
County borough	5,928	2.13	0.43	20

The most striking results were obtained from the county borough, and here the control group gives some further data. Considering the control group first, it is obvious that a great decrease in scabies was brought about merely by inspections, with subsequent treatment. A greater decrease took place in the group from the county borough where the hands and wrists were treated with benzyl benzoate. Dr. J. O. Irwin has kindly examined the detailed data of this experiment, and he finds that the decrease in incidence of the “treated” group was significantly greater than that of the “control”; but, even so, it is obvious that the extra trouble and expense of providing benzyl benzoate were very meagrely repaid.

Practical Conclusions from Experiment

The conclusion which may be drawn from this work with school-children is that frequent inspections by persons well-used to recognizing scabies will serve to reduce the incidence of the disease very greatly provided that cases, when found, are treated speedily and efficiently, and provided that the whole family of each case is also treated. Even quicker results would be obtained, and many children would be saved from ever having scabies, if regular inspections could be made throughout the whole population. This may not be possible, but propaganda which will make people scabies-conscious and willing to seek proper treatment for themselves and their families as soon as they suspect scabies can have a similar result. Incidentally, the majority of the population seem still to rely on self-treatment with widely advertised “remedies” that are either quite useless or improperly used, so that no cure is produced and the spread of the disease continues (Graham, 1944).

One further point which emerges from this investigation is that it is very unlikely that children often contract scabies inside the school buildings. A statistical analysis of the incidence in the various classes reveals that cases were scattered entirely at random throughout each school without any significant concentration in any class. Furthermore, it was very rare indeed to find two cases of scabies in adjacent desks. There seems no doubt that scabies is caught out of school, mainly in the home, so that exclusion from school for this complaint is only essential because it is usually a necessary preliminary to ensuring proper treatment. If there is any delay

in starting the treatment then the child is unnecessarily deprived of a period of education.

The occurrence of scabies in the Services may give some clue to the possibility of preventing the spread of the disease in the rest of the population. Early in this war a great deal of scabies was found in the Army in Britain, and the incidence appeared to be higher than that among the civilian population. Further investigations showed that this was not in fact the case, and the discrepancy was due to the frequent medical inspection of soldiers, so that their scabies was discovered while civilians harboured the disease undetected. Furthermore, it seemed likely that most of the scabies in troops was derived from civilian sources and that little actual spread took place inside the Services. This view is supported by consideration of what happens among troops when abroad. Among British troops in North Africa, where there was very little contact between them and the civilian population, scabies was practically non-existent and only to be found among recent arrivals from this country. Among isolated troops with efficient treatment of cases as they arise the disease rapidly disappears. It must be remembered that scabies may have an “incubation period” of nearly two months (Mellanby, 1943).

The facts described in this paper indicate that prevention of scabies is by no means a simple problem. If we could treat the whole of any population with benzyl benzoate we could wipe out the disease, but this is practicable only among limited and isolated communities where the incidence is substantial. On the other hand, if we can treat only part of the population—e.g., soldiers on service without treating their families, or school-children without any treatment in the home—then complete control is impossible. Frequent inspections among a population aware of the danger of this disease, followed by proper treatment of the cases and all their contacts, seem the only universally satisfactory method. There is no short cut to the successful control of scabies.

Summary

Experiments necessitating a quarter of a million inspections of school-children suggest that scabies prophylaxis is not practicable, apart from the normal treatment of the disease. But frequent examinations by personnel experienced in the diagnosis of the disease will reveal numerous cases; their treatment and that of all contacts can rapidly reduce the incidence of scabies.

It is necessary to allow the districts in which this work was done to remain anonymous; therefore I cannot acknowledge personally my gratitude to the various local authorities, medical officers, and teachers whose co-operation made the investigation possible. Most of the examinations of children were carried out by pacifist volunteers who were subjects for various medical experiments at the Sorby Research Institute. The expenses of the investigation were met by the Ministry of Health and the Medical Research Council.

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Medical Memoranda

A Case of Pneumococcal Meningitis Treated Successfully with Sulphathiazole

Although the recent literature contains records of the cure of pneumococcal meningitis by sulphonamides with or without serum, it was thought that the following case, successfully treated with sulphathiazole alone, might be of interest.

CASE RECORD

The patient, a postmaster aged 56, was in his usual good health when he retired to bed at 10.30 p.m. on May 8. At 2 a.m. next day he vomited, and at 4.45 a.m. was found in the lavatory in a dazed condition. He was put to bed, but became very restless and irrational, and at 6 a.m. was seen by his doctor and given morphine gr. 1/4. At 9.30 a.m. he was admitted to hospital, unconscious. On examination he was lying curled up on his left side, deeply stuporous and incontinent. His temperature was 100° F., there was slight neck rigidity, Kernig's sign was positive, and the pupils were small and equal and did not react to light. Apart from slight weakness of the right external rectus muscle, the cranial nerves appeared normal. The upper limbs were hypotonic but showed no paralysis; tendon-jerks were absent. The lower limbs were flexed, tone poor, knee-jerks diminished, and ankle-jerks present; the plantar response was extensor on the left side and flexor on the right. His pulse was 100, blood pressure 120/60; the apex beat

was half an inch outside the mid-clavicular line in the fifth intercostal space, and a few extrasystoles could be heard. Examination of the chest, abdomen, and ears revealed nothing.

Lumbar puncture was performed and turbid fluid was obtained; pressure, 120 mm. water. It contained 2,000 cells per c.mm., of which 98% were polymorphonuclears. No bacteria were seen in a direct smear, but a Type 18 pneumococcus was grown in pure culture. A blood count showed a leucocytosis of 22,500, of which 83.5% were neutrophil polymorphonuclears. Treatment with sulphathiazole was begun at 4 p.m. on May 9. Since oral administration was impossible, the soluble sodium salt was given intravenously, the patient receiving 20 g. in 6 pints of glucose-saline in the first 24 hours. Subsequently oral administration was possible, and he received 18 g. by this route in the second 24 hours and 24 g. during the next 48 hours, making a total of 62 g. in 96 hours. After a restless night the patient improved considerably during the course of May 10, becoming fully conscious and fully orientated by 4 p.m.; his temperature was then 100° F. and eye movements were normal. On the 11th improvement was maintained; the pupils were normal and the chest clear. A herpetic eruption on the lips started at this time, becoming more severe and extending to the left cheek during the next two days; it was accompanied by stomatitis and glossitis. On May 14 the temperature had dropped to 98.4° F., and the C.S.F., which was under normal pressure, contained only a few degenerate polymorphonuclear leucocytes, and proved sterile even after cultivation in media containing *p*-aminobenzoic acid. The condition of his mouth was improving. On May 16 he had a shivering attack and, since recurrence is common in this disease, a further course of 30 g. of sulphathiazole was given during the next four days. He continued to improve, however, and by May 24 was convalescent. He was discharged well on June 14, and has since returned to work. A primary focus of his infection was sought, with negative results; a radiograph of the chest (May 25) and of the accessory air sinuses (June 3) revealed nothing abnormal, and no focus in the middle ear could be discovered.

I am indebted to Dr. W. A. Bullough, County Medical Officer of Essex, and to Dr. O. W. Chapman, acting medical superintendent of the hospital, for permission to publish this case, as well as to Dr. C. F. Barwell, pathologist to the hospital, for the laboratory investigations.

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Treatment of Some Complications of Bacillary Dysentery

The sulphaguanidine treatment of bacillary dysentery has certain drawbacks. The drug is expensive and a large dosage is required; being an oral remedy, it is often precluded by vomiting in cases which need it most. Sulphapyridine has the advantage of being cheap, and it was found by Paulley to be at least as good as sulphaguanidine. More important is the fact that sulphapyridine and sulphathiazole have soluble salts which can be injected in urgent cases. That this advantage has not yet been exploited is due to the belief that the action of the sulphonamides in dysentery is exerted almost entirely within the lumen of the bowel.

We have now used sulphapyridine in the treatment of over 200 cases of bacillary dysentery in Lagos, injecting the drug intravenously in adults or intramuscularly into the scapular muscles in children whenever injection is indicated. Although our dysentery—practically all Flexner infections—might be expected to respond well to sulphonamides, it is often complicated by nutritional deficiencies of the vitamin B₂ complex. Gross signs of ariboflavinosis are very common in the adult population. Infantile pellagra ("kwashiorkor") is a deficiency syndrome of high mortality often occasioned by gastro-enteritis. Having found that undiluted milk could be taken with impunity as soon as sulphonamide therapy was established, we have given it in quantity to meet the demand for fluid and to supply the nutritional deficiencies. In urgent cases we have injected a crude liver extract to supply the B₂ complex. The results in simple cases were, as might be expected, invariably good. In complicated cases the combined therapy came well up to theoretical expectations.

The following cases illustrate our technique and results:

Case 1.—An African male aged 25. Admitted June 11, 1943—Flexner dysentery of one-day duration. Stool greenish, watery, with lumps of blood-stained mucus; vomiting, tenesmus marked. On June 12 sodium sulphapyridine solution 1 g. given intravenously and 1 g. every hour orally. Next day motions were brown and semi-formed, and thereafter no motion occurred for 3 days.

Case 2.—An African male aged 5 months. Weight 7 lb. 3 oz. Admitted May 14, 1943, for vomiting and diarrhoea of one week's duration. Breast-fed (test feeds showed only 2 oz.). Red tongue, emaciated, oedema of feet, and desquamation. Given astringent mixture and supplementary feeds. On May 17 stools still frequent, green, and slimy. Eyes sunken and staring; blinking absent. Sodium sulphapyridine 0.3 g. intramuscularly and sulphathiazole 0.5 g. every hour orally. On May 19 the stool was greenish and formed; eyelids blinked completely, but the child was drowsy—a condition which only too often precedes death in such cases. Two 2-c.cm. ampoules of exotrope were injected, after which improvement was rapid.

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Reviews

HISTORY OF SCIENCE

A Shorter History of Science. By Sir William Cecil Dampier, Sc.D., F.R.S. (Pp. 189; illustrated, 7s. 6d.) Cambridge: The University Press. 1944.

Sir William Dampier's *History of Science and its Relations with Philosophy and Religion* when first published in 1929 met with such immediate success that a second edition was called for in the following year. In 1942 he undertook the laborious task of bringing the work up to date. Then he was asked for a straightforward story of the growth of science reduced to its simplest terms, and has written this *Shorter History*. We must confess that on seeing a book of 189 pages we feared it could only present a catalogue of names and discoveries. But those fears proved groundless, and his two expressed aims have been successfully achieved. The first was to show how science, which now affects our lives so profoundly, reached its present predominance; the second was to place science in its appropriate relationship with other methods of thought. It is the story of man's attempts to understand the mysterious world in which he finds himself. He reminds us that "science did not germinate and grow on a healthy prairie of ignorance but in a noisome jungle of magic and superstition, which again and again choked the seedlings of knowledge," while placing it to the credit of Scholasticism that it prepared men's minds by teaching that the world was understandable.

Though we miss some of the engaging philosophical comments of the larger book, there are some pointed sayings, of which a few samples must suffice. "The aether, if there be an aether, is now crowded with 'wireless waves'—a consequence of Maxwell's equations—and however they are conveyed, it is certain 'not on the air'" (p. 104). "In the absorption spectrum of chlorophyll the maximum absorption coincides with the maximum energy of the solar spectrum, a remarkable adaptation, however produced, of means to ends" (p. 118). "It is impossible to predict the velocity of a particular molecule or the length of life of an individual man, but with a sufficient number of molecules or men we can deal with them statistically and say how many will move within certain velocities or how many will die within a given year. Statistical determination, but individual uncertainty" (p. 96). "To the behaviourist a man is only a nexus of stimuli and responses, because the method of investigation, by its own definitions and axioms, is merely the study of the relations between stimuli and responses" (p. 137). "Ritual is prior to and dominant over any definite belief. Compare this with some forms of modern psychology, which say, 'I react to outer stimuli, and so I come to think'" (p. 141). Sir William Dampier gives undeserved commendation to Capt. Cook for his researches on antiscorbutic remedies, whereas in fact Cook did nothing to help and a good deal to hinder the work of his ship surgeon in that direction.

The section on modern physics and astronomy is stiffer reading, and the ordinary reader may feel a sense of frustration at the admitted inability of the physicist to express his conception of matter in anything but mathematical equations. We are left with the discouraging conclusion that "a fundamental principle of uncertainty seems to lie at the base of our model of Nature," a change induced from the confident materialism of the last century, and due to the science which then seemed the most material—physics. But a healthy change, nevertheless.

A book worth meditating over, for it is the outcome of a well-stored and critical mind, with a capacity for distinguishing the essential from the incidental.

MAN'S ESSENTIAL DILEMMA

Conscience and Society: A Study of the Psychological Prerequisites of Law and Order. By Ranyard West, M.D., D.Phil. (Pp. 260. 15s.) London: Methuen and Co. 1943.

This book begins and continues as a philosophical discussion and ends as something like a tract. The sequel is unusual and does at any rate as much credit to the author's heart as to his head. His principal thesis is that mankind's essential dilemma is between mutual co-operation and mutual strife, which he relates respectively to an instinctive tendency to co-operation on the one hand and to aggressiveness on the