"the child if born would be likely to suffer from such physical or mental abnormalities as to deprive it of any prospect of reasonable enjoyment of life." Again this section is to be interpreted in the light of the "total environment."

Termination on the ground that a sexual offence has been committed against the woman is dealt with in clause 1(d) and clause 2(2) of the revised Bill. The latter section requires, before termination for rape, a doctor's certificate, but "no such certificate shall be given unless the woman who alleges she has been raped has consulted the said registered medical practitioner as soon as practicable after the alleged rape and there was then medical evidence of sexual assault." Both the B.M.A. Council and Lord Dilhorne oppose the inclusion in clause 1, section (d), of the words "when under the age of 16." The powers given under section (a) of clause 1 should be adequate to cover the situation. Despite the safeguards in clause 2, section (2), there must be reservations about the inclusion of rape in section (d) owing to the difficulty sometimes in establishing its occurrence.

The addition to the Bill of the need to obtain the patient's written consent (or that of the parent or guardian of patients under the age of 16) remedies a defect in the original Bill. What is left unstated is what happens in cases of emergency, when written consent may not be obtainable.

The clause in the earlier draft of the Bill specifying that except in emergency the termination "shall be performed in a hospital or registered nursing-home" has been omitted from the revised version. Therapeutic abortion, it seems, could therefore be performed anywhere. The B.M.A. Council adopted the Gerrard committee's recommendation that "normally termination of pregnancy will be undertaken in hospital. . . . In cases where termination is carried out in a registered nursing-home it should be undertaken only under such conditions as shall be prescribed by the Minister." Another important safeguard concerns who is permitted to perform a therapeutic abortion. The revised Bill makes it lawful for "a registered medical practitioner after obtaining a concurring opinion from a second registered medical practitioner to terminate a pregnancy . . ." (clause 1), provided that both practitioners certify in writing that in their opinion the termination of pregnancy is necessary on one of the grounds specified in sections (a) to (d) of the clause. Lord Dilhorne wants it to be specified that the two certifying practitioners must be "either the pregnant woman's regular doctor and a registered medical practitioner employed in a hospital under the National Health Service or two registered medical practitioners so employed." The B.M.A. Council thinks that, except in emergency, the doctor who performs the abortion should be "a surgeon with gynaecological experience who is in contract with either a regional board or board of governors of a teaching hospital." This proposal should provide sufficient safeguard against possible abuse.

A new clause in Lord Silkin's Bill would make notification of a therapeutic abortion within seven days of its performance a statutory obligation. Notification is to be made to the Chief Medical Officer of the Ministry of Health by the doctor performing the operation. But the statement that the information contained in such notification may be divulged to "a police officer duly authorized to obtain such information" will need explaining before its innocence can be accepted. Anything which conflicts with a patient's right to confidentiality in medical treatment is not only unacceptable in itself but would make the whole Bill unacceptable.

It is essential that any reforms in abortion law should have medical opinion behind them. Lord Silkin's Bill clearly is not in that position, if only because doctors have had too little time to consider it. Sir Hector MacLennan, President of the Royal College of Obstetricians and Gynaecologists, has stated[4] that a very considerable body in his College, while favouring some liberalization of the law, thinks that the Bill's sponsors are proceeding precipitately. He has asked for an interdepartmental committee of inquiry. At Swansea the Representative Body asked that the Government should not introduce legislation until the B.M.A.'s committee had reported.[5] It would seem wise, therefore, for the would-be reformers to make haste more slowly. By so doing they are likely to gain their end more surely.

Attack on Schistosomiasis

Schistosomiasis (or bilharziasis) is on the increase, and though the ideal molluscicide has not yet been developed some striking successes have been achieved by the widespread application of preparations that are available.[1] The development of these new molluscicides over the past decade has brought us nearer to stopping the transmission of schistosomiasis, but it is unlikely that control of snails alone will be entirely successful. Some kind of mass treatment of the infected human population will probably also be required. The question thus arises, What drugs can be used?

In the past antimony therapy has been the cornerstone of treatment, though it is far from satisfactory. Among non-antimonial drugs given by mouth which have been introduced in recent years lucanthone hydrochloride (Nilodin) is the only one which has established itself as a possible alternative to antimony. The therapeutic effectiveness of any new drug must be considered in relation to its toxicity. All available schistosomicidal drugs have some side-effects which limit their use on a mass scale. Consequently a drug free of unwanted effects which can be easily administered in repeated courses may be more acceptable for widespread application than a drug producing a high rate of cure but a variety of unpleasant side-effects. While it may be comparatively simple to determine the toxicity of a drug, the evaluation of its schistosomicidal properties is not, and there is little agreement on the best methods of carrying out such an inquiry or on the criteria of cure. Within the past few years evidence has been obtained suggesting that several factors might affect the results of therapy, among them being the age of the patient, his diet, the intensity of the infection, and possibly the strain of parasite. It is not therefore surprising that results vary among different workers in different places when the same drug is being evaluated. Until the relative importance of such factors have been precisely determined and comparable groups treated, with agreed criteria of cure, the study of any drug will be inconclusive. However, a start has been made in evaluating critically the effectiveness of different drugs through the establishment of a centre run by the British Medical Research Council and the World Health Organization in Tanzania in an area where *Schistosoma haematobium* is endemic. More centres are needed, but the existing one can perhaps act as a prototype for others in different countries and in areas where *S. mansoni* and *S. japonicum* are endemic.

[1] *Brit. med. J.*, 1965, 2, 251.
[2] Forsyth, D. M., *Lancet*, 1965, 2, 354.

Even if treatment does not rid the patient of parasites it may give benefit in that some adult worms will probably have been killed and the rate of deposition of eggs in the tissues will have been reduced. Perhaps the risk of the crippling sequelae of bilharziasis will be lowered if, in the absence of cure, the output of eggs can be restricted to a much reduced level. Consequently, in evaluating the effectiveness of drugs some workers are studying the egg output in addition to the "cure rate." This entails the quantitative estimation of the patient's egg load before and after treatment, and while this method may be considered time-consuming it does enable the "degree of cure" to be determined and to be compared with intensity of infection.

The concept of suppressive therapy with spaced treatments —and generally reduced side-effects—has been extensively investigated in recent years. The drugs chiefly used have been sodium antimony dimercaptosuccinate (TWSb) and more recently bucanthone hydrochloride. D. M. Forsyth[2] has recently drawn attention to the "shift" of worms under the influence of antimony. Suppressive therapy was more successful in treating infections by *S. haematobium* than by *S. mansoni,* and it is considered that this might be due to the movement of worms in response to the drug. The adult worms of *S. haematobium* are thought to migrate from the blood-vessels of the urinary tract to the lungs. They may be immobilized there and their breeding be reduced. But the adult worms of *S. mansoni* are believed to migrate to the liver, whence return is easy to the mesenteric veins if drug treatment is not maintained. The search for new drugs has received fresh stimulus from biochemical studies of the schistosome and its food requirements. When these are known it is possible that the way may be open for the development of drugs by better-informed methods than at present, thus eliminating the empirical screening of thousands of substances for schistosomicidal action.

A paper by Dr. P. Jordan in the *B.M.J.* this week (page 276) reports on a trial in Tanzania of a new drug for the treatment of *S. mansoni* infection. Designated Ciba 32,644-Ba, and since publicized as Ambilhar, the drug appeared to be less effective than TWSb, though in higher doses it may prove to be more so. In addition a letter appears from Professor A. W. Woodruff (page 291) in which he is rightly critical of the recent publicizing of Ambilhar in the lay press despite a lack of reports in scientific periodicals of its effectiveness. This kind of publicity is indeed disconcerting, and it becomes even more so when one of the first papers to give a clinical evaluation of the drug suggests it may be less satisfactory than drugs already in use.

Spinach—a Risk to Babies

Though traditionally regarded as a healthy and even invigorating vegetable, spinach may have some hazards after all. A. Sinios and W. Wodsak have recently given an account[1] of 14 children in Germany who developed methaemoglobinaemia after eating it.

Methaemoglobinaemia is one of the causes of cyanosis ; it may occur as a genetic defect[2 3] or as a result of treatment with acetanilide, phenazone, phenacetin, or nitrites. Nitrates taken in the food or for therapeutic reasons may be converted into nitrites by the action of the intestinal bacterial flora,[4] and the condition may also be caused by aniline derivatives and potassium chlorate.

In methaemoglobinaemia the ferrous porphyrin complex is oxidized to the ferric form, which cannot combine with oxygen and is useless for respiration. The methaemoglobin concentration in the blood is normally kept at a level of 1.7 g./100 ml. by constant reduction.[5] If it rises above this level from any cause reduction may be achieved by a slow intravenous injection of a 1% aqueous solution of methylene blue in a dosage not exceeding 1 mg. per kg. body weight or by ascorbic acid by mouth.

Agents causing methaemoglobinaemia are less well tolerated in early life than later.[6] In the newborn baby foetal haemoglobin accounts for 60–80% of the total haemoglobin, but by the age of 3 months only 30% remains.[7 8] Foetal haemoglobin is much more readily oxidized to methaemoglobin than is adult haemoglobin. Infants are also at risk because of a temporary deficiency of methaemoglobin reductase or of its co-enzyme, reduced diphosphopyridine nucleotide, which is normally generated by glycolysis in the red cell.[9]

Fresh spinach contains up to 180 mg. nitrate per 100 g., but no nitrite. Nitrates are found in higher concentrations in spinach grown in beds fertilized with manure. In 24–48 hours after gathering the leaves the nitrate content falls and nitrites increase up to 66 mg. per 100 g. In fresh frozen spinach nitrites appear on thawing, but the content is low in baby food sold in glass jars. During cooking about 80% of the nitrate is dissolved, but in Germany the water is often used for making spinach purée.[1] This practice is uncommon in Great Britain, where cookery books and books on dietetics advise draining and pressing the spinach after cooking.

The children described by Sinios and Wodsak were aged between 2 and 10 months and developed their methaemoglobinaemia after eating spinach which was rich in nitrites. In 12 of the cases spinach had been bought fresh. Poisoning occurred from eating the purée and in two cases from drinking the water in which the spinach had been cooked. Spinach taken soon after preparation did not cause cyanosis in 12 cases, but it developed one to three hours after a meal of spinach kept for 24 to 48 hours, in four cases at room temperature and in five others in the refrigerator. In seven cases the mother found no alteration in the taste of the spinach. One baby with a methaemoglobin concentration of 80% died soon after admission to hospital.

The symptoms depended on the amount of nitrite absorbed, and varied from grey-pale cyanosis in mild cases to rapid pulse and respiration and muddy cyanosis in severe cases. Most of the babies continued to smile and play, but a few collapsed. Vomiting and diarrhoea were probably the result of the action of nitrites on the stomach and intestines. The chocolate colour of the blood was striking and persisted after oxygen was passed through the samples.

The reduction of nitrates to nitrites must have occurred mainly during the storage of spinach, since the first meal did

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3 Gerald, P. S., "The Hereditary Methemoglobinemias," in *The Metabolic Basis of Inherited Disease*, 1960, p. 1068. New York.
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