position and appearance are precisely as in the St. Catherine's Thorpe specimen, and it is almost certain that we need look no further for a diagnosis. After the onset of the condition increased stresses are thrown on the medial and lateral extensions of the quadriceps tendon of insertion, with roughening of the bone, as found here. No osteoarthritis, which might suggest a chronic functional disturbance, is present in the hips, knees, or feet of this man, so it seems likely that he suffered little interference with locomotion.

The frequency of Osgood–Schlatter disease in the Saxon period is unknown. In the course of examining about 2,000 tibiae this is the first case I have seen that looks at all convincing.

My thanks are due to Mr. F. W. Cheetham, Director, City of Norwich Museums, for permission to publish this case.

—I am, etc.,

Norwich, Norfolk. CALVIN WELLS.

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Ocular Damage due to Paraquat and Diquat

SIR,—In their article (27 April, p. 224) Mr. J. S. Cant and Dr. D. R. H. Lewis comment that the ocular burn in their case "was similar to that produced by an alkali, which becomes bound to the tissues of the eye, but, unlike alkali burns, the effect was very slow and there was no immediate damage." Lest this should give the impression that eye splashes from the bipyridyls (paraquat and diquat) have all the features of alkali burns, I should like to stress the important differences, not least in prognosis, between bipyridyl and alkali burns, based on experimental study of both types of burn and on following up, with colleagues who have consulted us, the progress of several patients with eye splashes from paraquat or diquat.

The essential difference is in the depth of tissue damage. With alkali, penetration of the eye tissue is extremely rapid, and with all but the smallest splashes deep injury to the cornea is invariably caused, with the attendant danger of permanent interference with vision from subsequent formation of scar tissue. With the bipyridyls the damage, though it may be extensive, is mainly superficial, and, given prompt and adequate treatment to control infection and prevent the formation of adhesions between denuded bulbar and palpebral surfaces, the prospects for full and complete recovery are excellent.

Dr. David Sturman, senior eye registrar at the Wellington Hospital, Wellington, New Zealand, sent us in June 1966 a very full description of the treatment and course of a female patient splashed in both eyes with "Preeglone" Extra. Here the injuries were more severe than in the case of Mr. Cant and Dr. Lewis. The patient was kept in hospital for a total of 23 days, and at first on discharge suffered from some loss of visual acuity in one eye owing to corneal oedema and from epiphora owing to stenosis of both lower puncta and obstruction in the canaliculi. The epiphora was cured by syringing of the lacrimal ducts, and the corneal oedema gradually cleared to give full recovery of vision.

Dr. Sturman's report first alerted us to the fact that the bipyridyls produce more effect in the human eye than our experimental investigations suggested, and it has been the basis of our recommendations in several subsequent cases which have been treated successfully.

It should be added that the labels on all liquid formulations of the bipyridyls carry the warnings: "Wear rubber gloves and face shield when handling the concentrate. Wash concentrate from skin or eyes immediately." —I am, etc.,

A. A. B. SWAN,
Director,
Industrial Hygiene Research Laboratories,
Imperial Chemical Industries Ltd.
Macclesfield,
Cheshire.

Teratogens and the Abortion Act

SIR,—In the post-thalidomide era much attention has been directed to the problems of congenital abnormalities produced by external agents of an artificial kind, thus giving impetus to investigations in the field of experimental teratology. With reference to the memorandum from the Medical Defence Union (23 March, p. 759), attention is directed here to the particular circumstance of possible foetal damage as a consequence of some exogenous factor.

Cases of human congenital abnormalities have been reported in association with Asian influenza, carbon-monoxide poisoning, hypoxia, progesterone, insulin, antithyroid substances, maternal diabetes, immunological reactions, hyperemesis gravidarum, etc. Few exogenous factors (radiations, rubella, aminopterin, toxoplasmosis, and thalidomide) have been proved, with some degree of certainty, to be teratogenic in man. In these circumstances, where the extrinsic factors are known to be teratogenic in man, termination of pregnancy seems justified.

However, the teratogenicity of a large number of exogenous agents has been demonstrated in various laboratory animals. This suggests possible teratogenicity for humans, and with this a "substantial risk that if the child were born it would suffer from such physical or mental abnormalities as to be seriously handicapped." To what extent can one correlate the results of animal experiments with teratogenicity in the human foetus? The existing animal tests have poor predictive value for human teratogenicity. Because of the limitations experienced with animal testing and the varying conditions under which these experiments are carried out every effort should be made to standardize methods and define clearly objectives in experimental teratology. Taking these into consideration, animal experiments would continue to provide useful information on the ability of exogenous factors to induce developmental deviations.

Because of the problems involved in allowing an objective assessment from animal experiments, the possibility of a harmful effect on the human foetus must be considered when a decision has to be taken with respect to the termination of pregnancy. The systematic collection and analysis of all reports on human teratogenicity, followed by experimental testing of the suspected teratogens in several species of laboratory animals, appear to be useful for the present in guiding such a decision.—I am, etc.,

T. V. N. PERSAUD.
Department of Anatomy,
University of the West Indies,
Jamaica.

Explosion Fractures of Heels

SIR,—Fractures of the calcaneus are usually the result of falls, as from scaffolds or ladders. During time of war heel injuries may be sustained by sailors when a torpedo or bomb explosion below decks causes a sudden upward lifting of a ship's plates. A mine exploding under a land vehicle can have the same effect.[1 2]

Injuries of this kind occurred among a group of civilian workers on a barge in the Hudson River, near Albany, New York, in September 1967. The men were engaged in placing the last of some dynamite charges in 10 m. of water to enlarge a navigation channel. A passing ship failed to slow sufficiently and generated a large wake at the work site.

One of the dynamite loads became fouled in the drilling equipment beneath the barge and exploded, setting off all the other charges. The vessel was lifted 1 or 2 m., throwing the five men on board into the air. Two of the crew fell back on the barge, while the other three were flung into the water. The men were rescued almost immediately, while the barge sank slowly.

Three of the five workers sustained bilateral comminuted fractures of the calcanei. A fourth had fractures of the lower shafts of the tibia and fibula on one side, with a fracture of the neck of the radius on the opposite side, in addition. The fifth man had small fractures of the talus and the navicular bone of one foot and a small compression fracture of the first lumbar vertebra.

One of the victims knowledgeably remarked that it was fortunate that all the charges had gone off together. If an underwater explosion had occurred while any of the men were in the water, they would almost certainly have been killed.[3]

PAUL O'CONNOR.
Albany Medical Center Hospital,
New York

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Drugs and Hyperthyroidism

SIR,—In their interesting article (27 April, p. 217) describing the effects of hyperthyroidism on the toxicity of depressant and antidepressant drugs in mice Dr. A. Ashford and Miss Janet W. Ross draw attention to the possible hazards in the use of these drugs in hyperthyroid patients. From the results of our own experiments in rats, in which we have measured the effects of treatment with thyroxine or 3,5,3′-triiodothyronine (2–5 mg./kg./9–15 days s.c.) on sensitivity to a wide range of drugs, we would not only support their warning but also extend it to cover central stimulants and other classes of drugs as well.