LOCAL INFECTION WITH PASTEURELLA SEPTICA FOLLOWING A DOG-BITE

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Pasteurellosis is commonly seen in animals and birds but rarely diagnosed in man. Cats and rabbits seem to have been responsible for most human cases (Schipper, 1947), and, despite the frequent occurrence of pasteurellae in the saliva of healthy dogs, only three cases of human infection following a dog-bite have been reported (Allott *et al.*, 1944). A further case is now recorded.

Clinical History

A boy aged 9 was bitten by a dog on September 10, 1952. Three inches above the right medial malleolus there was a clean gaping laceration of the skin and subcutaneous tissues, $1\frac{1}{2}$ in. (3.8 cm.) long. Routine wound toilet was carried out, the wound sutured, and A.T.S., 750 units, given intramuscularly.

On September 16 infection was present with oedema and discoloration of the wound edges. An intramuscular injection of 300,000 units of procaine penicillin was given daily for three days, and the sutures were removed. The wound failed to heal, and a swab taken on September 17 yielded a pure growth of *Pasteurella septica*.

Sulphadimidine by mouth (1.5 g. at once and 1 g. six-hourly) was begun on September 23 and continued for five days. The boy's temperature rose on two occasions to 99.2° F. (37.3° C.), but he remained well. X-ray films of the right tibia showed no bony change in the region of the bite. The wound, following the course of sulphadimidine, became dry and granular but showed little tendency to re-epithelize, so that split-skin grafting was undertaken on October 15. Oral sulphadimidine was given for five days. Healing was complete 68 days after the bite was sustained.

Bacteriology

Wound swabs taken from the patient on September 17 and 23 grew a pure culture of a non-motile Gram-negative coccobacillus identified as *P. septica*. This organism showed bipolar staining with methylene blue, and capsules were present in preparations made from the peritoneal exudate of injected mice. The organisms grew best under aerobic conditions, and on blood agar produced low convex colonies 1.5 mm. in diameter with an entire edge. The colonies were clear peripherally with a greyish-white centre and a smooth shiny surface. They were butyrous in consistency and were readily emulsified. On MacConkey medium there was no visible growth after seven days' incubation at 37° C.

Biochemical Reactions.—The following carbohydrates were fermented without gas production: glucose, maltose, saccharose, raffinose, galactose, and trehalose. L.M., no change; indole, +; M.R., —; V.P., —; H₂S produced in small quantities; catalase, +; methylene blue reduction, +; NH₃ production, +; nitrate reduction, +. With the disk technique (Thompson, 1950) the organism was sensitive to penicillin, streptomycin, aureomycin, and chloramphenicol. It was also sensitive to sulphadimidine, 10 mg. per 100 ml.

Serology.—No antibodies could be demonstrated in serum obtained from the patient on October 1 and 8. Serological study of the organism was kindly undertaken by Mr. J. E. Smith, of the Department of Pathology, the Royal Veterinary College, London, who found that sera prepared against *P. septica* types most commonly found in healthy dogs

agglutinated the isolated strain, while sera prepared against other *P. septica* types failed to do so. Six sera from healthy dogs agglutinated the isolated strain to the titre expected from previous work on agglutinin levels in healthy dogs against dog strains.

Discussion

This is one of 90 cases of dog-bite (in 10,179 accident cases) seen at Guy's Hospital casualty department during the period January 1 to November 15, 1952. Fourteen of these dog-bites showed evidence of infection, and in four healing was delayed beyond a fortnight, the longest to 40 days.

The wound in the present case appeared clean, with non-bevelled edges, and was treated by primary suture without excision—an omission not justified by subsequent events.

In view of the reports of underlying bony disease associated with wound infection with *P. septica* (Allott *et al.*, 1944; Cooper and Moore, 1945) x-ray films were taken of the right tibia. These showed no evidence of osteitis.

According to J. E. Smith (personal communication) the isolated strain is similar in its sugar-fermentation reactions and, antigenically, to strains commonly found in the saliva of healthy dogs, and it is surprising that human infection following dog-bite is rarely reported. Information has been obtained from the director of the Public Health Laboratory Service that, in the laboratories of his service, during the past two years *P. septica* has been isolated from dog-bite wounds on a number of occasions. This suggests that the condition might be discovered more often by routine swabbing of all dog-bites.

Summary

A case of local infection with *P. septica* following a dog-bite is reported.

The infecting strain proved to be of a type commonly found in the saliva of healthy dogs.

It is suggested that routine swabbing of dog-bites might show that infection with *P. septica* occurs more commonly than is generally realized.

Our thanks are due to Dr. F. A. Knott and Mr. P. W. Clarkson for permission to publish this case and for their encouragement and advice, and Mr. J. E. Smith, of the Department of Pathology, Royal Veterinary College, Camden Town, for his serological investigation of the *P. septica* strains.

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Medical Memorandum

The Age of the Menarche in the Tropics

When Ellis (1950) summarized recent studies on the age of onset of menstruation in various climates he mentioned the difficulties inherent in obtaining accurate data in tropical countries. His own reliable observations in the hot moist climate of Lagos City, Southern Nigeria, did not confirm the widely held belief that children in the Tropics mature early.

We have been able to augment our earlier studies of the age of the menarche in English children (Wilson and Sutherland, 1950b) with data carefully collected in schools in Northern Nigeria, Central India (C. Thomson, 1952, personal communication), and Ceylon (Wilson and Sutherland, 1950a). These areas all lie between latitudes 5 and 20 degrees N., and the observations relate with one exception to homogeneous racial groups. As in England, each girl was asked simply for her present age and whether or not her periods had started. From the replies the average age of

Age of Attainment of the Menarche in Nigeria, Central India, and Ceylon Compared with Southern England

Group	No. of Children	Age of the Menarche	
		Mean Age in Years	Standard Deviation of Age in Years
Southern Nigeria (Ellis, 1950):			
Ibo and Yoruba:			
Series 1	300	14.22	1.00
" 2	142	14.40	Not available
Northern Nigeria:			
Plateau pagans	74	14.50	1.24
Northern girls at school	172	14.14	0.61
Central India (Thomson, 1952):			
Aboriginals: Munda, Oraon, Santal	411	14.65	1.55
Ceylon:			
Rural Cingalese	296	14.39	1.73
Colombo city schools (various eastern races)	844	12.84	1.24
Southern England	2,590	13.49	1.19

onset of menstruation may be calculated by the statistical technique of probit analysis. The results, together with those of Ellis (1950), are summarized in the Table.

The menarche occurs relatively late in the hot dry climate of the Northern Nigerian savannah (14.14 years, with a remarkably low standard deviation), on the more temperate Plateau (14.50 years), and in Central India (14.65 years), where high temperature and high humidity are combined. The observations in Ceylon are of special interest. The onset in the rural group of Cingalese children (14.39 years) approximates to that in Nigeria and Central India, but the urban children in Colombo show an early onset of 12.84 years. This city group is racially mixed, and includes Cingalese Burghers of Dutch origin and Tamils from South India, each with their own social environment. It is unfortunate that our records do not permit a subdivision of this group into more homogeneous racial units.

The groups of children studied differ in food habits, nutritional status, and social environment, as well as in climate and race. Without much more extensive observations it is not possible to assess the relative importance of these differences in influencing the age of the menarche. It is, however, clear that in tropical countries the onset of menstruation, compared with that for English children, may be either early or late, and that in these latitudes it is not determined solely by the climate.

We acknowledge the help received from Dr. Claire Thomson, of the S.P.G. Mission in Central India, and from Dr. Anne Gall in Northern Nigerian schools.

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A Directory and Catalogue of Collections of Micro-organisms Maintained in Australia is now available from the Commonwealth Scientific and Industrial Research Organization, Melbourne. It has been prepared, in common with other Commonwealth directories, on the recommendation of the British Commonwealth Specialist Conference on Culture Collections of Micro-organisms held in London in 1947. The Australian directory lists 42 institutions where collections are maintained. In each case the address of the institution, the name of the doctor, and the types of cultures maintained and how they are distributed are given. In addition there is an alphabetical list of species which shows where each species may be obtained in Australia.

Reviews

TRENDS OF LIFE

Trends of Life. By F. Wood Jones, F.R.S. (Pp. 191. 10s. 6d.) London: Edward Arnold. 1953.

In this short book of 190 pages Professor Wood Jones summarizes the ideas at which he has arrived after a whole lifetime's study of living things. He declares himself unashamedly unorthodox. He believes that "the distinction of living matter is its power of self-maintenance which is manifested in activities that are characteristically directive." In his opinion this basic quality of life has been concealed by the developments in biology which were inspired by Darwin's theory of natural selection as the main cause of evolution, and he suggests that the essence of the matter is also overlooked in most modern laboratory experimentation.

In support of his views Professor Wood Jones mentions many examples of adaptations by animals to the special circumstances of their lives, and of forms of behaviour which permit them to survive and multiply. In many cases I do not find at all convincing his argument that such phenomena cannot be easily explained by natural selection. Nevertheless, there is little doubt that the orthodox and simple form of the theory of natural selection is not altogether adequate to explain all the facts that one can discover in nature. It is salutary for experimental biologists to be challenged from time to time by those who have made a wide study of the forms and activities of living things, but this is perhaps more likely to lead to a development of our modern theories than to the supersession of them which Professor Wood Jones seems to call for. But he has rendered a service of great value to science by showing afresh the whole range of the problems which have to be faced.

The book ends with a consideration of man and his future in the light of the point of view which Professor Wood Jones has developed about the evolutionary process in general. He is extremely pessimistic. Man, he says, has become a barbarian "everywhere engaged upon a campaign for the wholesale obliteration of life," and he regards it as inevitable that the total food yield of the earth will eventually diminish. The state of the world is certainly not such as to inspire one with great confidence, and prophecies of woe are perhaps not out of place: but they have been survived before.

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DIFFERENTIAL DIAGNOSIS

Clinical Investigation: A Manual for Practitioners and Students. By E. H. Stokes, M.D., Ch.M. (Sydney), F.R.A.C.P. Foreword by G. E. Beaumont, D.M., F.R.C.P., D.P.H. (Pp. 628; 344 figures and 6 coloured photos. £5 5s.) London and Sydney: Angus and Robertson. 1953.

This book is unusual in that it combines a careful and detailed description of clinical methods with consideration of the significance of symptoms and regional physical signs. It is much more, therefore, than a primer for medical students, and may be accepted as a textbook of differential diagnosis with special emphasis on the detection and understanding of physical signs. The author has performed his task with conspicuous success.

First, he describes the art of case recording, and then follow sections on the general appearance of the patient and examination of the main bodily systems. The more important biochemical investigations are referred to in the appropriate sections, and in an appendix the author sets out the normal values for various blood and cerebrospinal-fluid constituents—a most helpful addition which might well be adopted by all authors of textbooks of medicine.

In considering the position of the apex of the heart by palpation the value of sitting the patient up should be mentioned. Failure to do this to the obese has brought