

sketchy, the "Elm Decline" more complex than is suggested even in passing (page 33) and the dates for the pollen zones unusual (page 42). For the archaeologist the theory of "cyclical settlement" in the Bandkeramik culture is evasively treated, and while in general it is useful to have the material marshalled in terms of the conventional cultural model it would have done to show some awareness of its deficiencies. Like the Mesolithic and Neolithic themselves it is retained in archaeology for its classificatory convenience rather than its explanatory value. But if the book is characterized more by conservatism than by innovation this does not lessen the fact that it is a valuable piece of work as a guide to the East European material. There is a great deal of information, description and references, which will be of value to archaeological students, while the text is sufficiently general in tone to reach a wide audience. The paperback edition in particular is excellent value for money, and a wide-ranging survey at this level was badly needed.

JOHN NANDRIS

Ball Lightning

The Nature of Ball Lightning. By Stanley Singer. Pp. ix+169. (Plenum: New York and London, 1971.) £5.85.

THIS is an excellent book. Stanley Singer has collected a formidable number of reports and theories on ball lightning and he presents these in a form which is both instructive and enjoyable. The book is well referenced; the list of nearly 600 published accounts forms an excellent bibliography in its own right.

The general features of ball lightning are first described on page 2 and are stated in slightly different form in the final chapter. If one combines these descriptions one might describe it as a luminous globe, frequently 25 cm in diameter, which occurs in the course of a thunderstorm, usually associated, although not necessarily directly in time or in location, with ordinary lightning. It often moves in a horizontal path at a low velocity and may last for several seconds or even minutes, disappearing suddenly with a loud explosion or without a sound. The author gives a minimum of comment and occasionally one could have wished that he might have questioned the veracity of some of the accounts. For example, the first two paragraphs on page 36 quote reports which are suspect. The first concerns the sighting of balls at 18 km which were 1° in angular diameter. These moved 10° in about half a minute. The author does not interpret this in similar

terms to the other reports. If one does, one finds that the balls are 300 metres in diameter and move at 300 km h^{-1} . They are probably an entirely different phenomenon. In the following paragraph a ball is described as the size of a cricket ball at 1.5 km. This is at or beyond the limit of resolution of the eye.

Stanley Singer makes it clear that all the theories to date are pathetically inadequate to account for the observations. Almost everything has been tried apart from the possibility of a macra-sized fundamental particle with a half life of one minute. Many theories founder on their inability to account for the stability of the phenomenon. Electrical discharge theories are discounted for their failure

to account for "some of the most striking characteristics, its motion, its appearance in enclosed spaces, and its failure to be affected by conductors". Plasmoids at first seem promising but they cannot be retained in the absence of self gravity or a similar, unknown, force. Chemical theories and those depending on vaporized metals do not fit the facts in the majority of observations. Radio frequency fields are shown to be more likely criminals but ducted waves which have been suggested to give a concentrated constant energy input can hardly explain the smooth and almost intelligent passage of the balls in airliners and many other observed locations.

The author concludes by suggesting that there may be many different types

Clothing

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The Science of Dress. [CHAP. VII.]

instead of hanging forwards as before, will incline backwards, his chest will grow broader and his back narrower, and his face bright and rosy with the improvement in circulation and breathing. On first standing erect he may feel somewhat stiff, owing to the previously unexercised muscles of the chest and back being brought into forcible action; the same feeling is experienced by adults, accustomed to stoop, when placed erect.



Fig. 4

A very pretty and nice dress for boys when breeched is the sailor's suit (see Fig. 4), which, by its looseness, allows free movement, is very durable, and covers all the limbs. The jacket must not, however, as is sometimes done, be cut low in the neck; or, if so cut, it must be filled up with a thick white flannel, so as to keep the warmth equal.

Under the suit flannel drawers and vest or combinations should be worn. Sailor suits should, however, be made with trousers, and may be worn till the boy is old enough to wear ordinary trouser suits.

The artist in mistake represented knickerbockers in the above illustration.

It is a pity that little girls as well as boys should not enjoy the freedom of Jersey knickerbocker and sailor suits; but prejudice is against this at present.

A page from Ada Ballin's *The Science of Dress in Theory and Practice*, 1885, reproduced in *Materials and Clothing in Health and Disease* by E. T. Renbourn, whose contents range from a chapter on the biophysics of textiles (by W. H. Rees) to a discussion on the psychology of fashion (H. K. Lewis, London, 1972; £9.50).