

hand, allowed behaviour to be controlled without any visual inputs over much longer distances --up to 23 yards at least, although with a considerably smaller accuracy if they are used for periods lasting longer than 8 seconds.

Further evidence for internal subdivision of the field of co-presence comes from ergonomic research. Fuller et al. (1978) and Bottom and Asworth (1978) studied motorists' driving skills. Their results strongly point to the existence of clear-cut "discontinuities" in the way space surrounding people is perceived and reacted to. It appears that people while driving tend, in the terms of their actual control of the vehicle's speed and movement, to divide the space in front of their cars into three zones. The first zone, one which is covered by the car in less than 2 seconds, is the immediate and direct environment of the car in the sense that no alteration to the vehicle's speed and the course can be obtained here. The second zone, one in which the car's behaviour can be manipulated and the one in which the driver's reactions are intricately coupled to the behaviour of the preceding vehicle, stretches over a distance corresponding to 2-9 seconds of driving. Finally, it was established that the space between two cars which is larger than the distance covered in 10-12 seconds of driving is perceived as an "open road" in which the preceding vehicles can be, and are indeed, seen but is not closely attended and reacted to by the vehicles which follow them.

From the above review of literature, it can be seen that although a number of studies have yielded results which bear on the issue of the *physical extent, shape and internal structure* of the field of co-presence, these questions were hardly given any direct treatment. For this reason the results of a recent ethological study reported in Ciolek (1979) are of special importance here. In the course of an observational study conducted over a period of 4½ years in a number of pedestrian settings in Australia, he has found that people gather the information about the presence of other people in a highly selective way: the ordinary users of ordinary public settings appeared to be attentive to the presence, movement and activity of other human beings *only* if they were no further than within the first 100 yards from them. Individuals and groups located beyond this distance tended to be completely disattended and their existence was ignored. Further, Ciolek's investigations demonstrated that the overall field of co-presence is structured and consists of five concentrically nested zones. These zones tended to correspond to the ranges of effectiveness of man's senses, namely: (i) vision, (ii) hearing, (iii) smell, (iv) touch mediated by the use of tools, and finally (v) direct tactile contact. The radii of these zones were found to be harmoniously interrelated and to be 100, 33, 10, 3 and 1 yard, respectively. Thus, what the collected data seemed to suggest was that the spatial field in which people were perceived by one another appears to be built of five interlocking zones, the area of which is approximately 1/9th of the previous one. These values have

been found to remain in good agreement with data on the neurophysiology of man's sensory apparatus (Melbin, 1972; Bioastronautics Data Book, 1964; Hall, 1964), with data on spatial parameters of some of man's built environment (Schefflen, 1976), as well as with data on the spatial parameters of such face-to-face interactions as outdoor sports and games (Arlott, 1975).

From what has been said so far, it is possible to list main features which are thought to characterize space in which people interact, move and communicate.

1. The total extent of the space within which a social situation prevails may be equated with the spatial field of co-presence or that area within which one is alive and responsive to other people's movement, behaviour and appearance (Goffman, 1963).

2. The field of co-presence, on the whole, is much smaller than the geographical limits of a relatively unobstructed outdoor setting. It is also smaller than the upper, theoretically possible range of operation of people's unaided senses (Goffman, 1971; McBride, 1972; Ciolek, 1979; Gilinski, 1951; Smith et al., 1975).

3. The field of co-presence tends to be a discontinuous one. It appears that the impact of presence or of behaviour of one person on that of another grows in a non-linear fashion as the interpersonal spacing decreases. However, contrary to the views suggesting that the "magnitude" of the physical presence is merely inversely related to the square of the distance separating him from an observer (Lundberg et al., 1972; Knowles, 1978), it appears that the domain of co-presence is *structured* and made of at least two (Goffman, 1963; Sandstrom, 1951, 1974; Thomson, 1977; Fuller et al., 1978; Bottom and Asworth, 1978) and most probably five zones (Ciolek, 1979) corresponding to the various degrees one person can be present to another. It is also highly probable that these zones are additionally divided into a number of sub-zones (Hall, 1964; Schefflen and Ashcraft, 1976; DeLong, 1978), requiring of people the appropriate conduct.

4. It is plausible to think that whenever the extent of the spatial field of co-presence exceeds that of a particular setting, it assumes the setting's shape and fills the entire area contained within the walls and barriers forming a given place. On the other hand, in the large-scale and unstructured spaces in the case of stationary people, its shape can be assumed to be roughly circular with a given set of observers positioned in its center.

5. It appears that the size of the field of co-presence grows with the increase in the speed of the observer's movement through a given setting (Wallace, 1973; Tunnard and Pushkarev, 1963). For stationary observers and those moving with usual pedestrian velocities (5 km/h) it may be hypothesized to be (Ciolek, 1979) 100 yards in radius and be similar for most of the observers engaged in a given type of