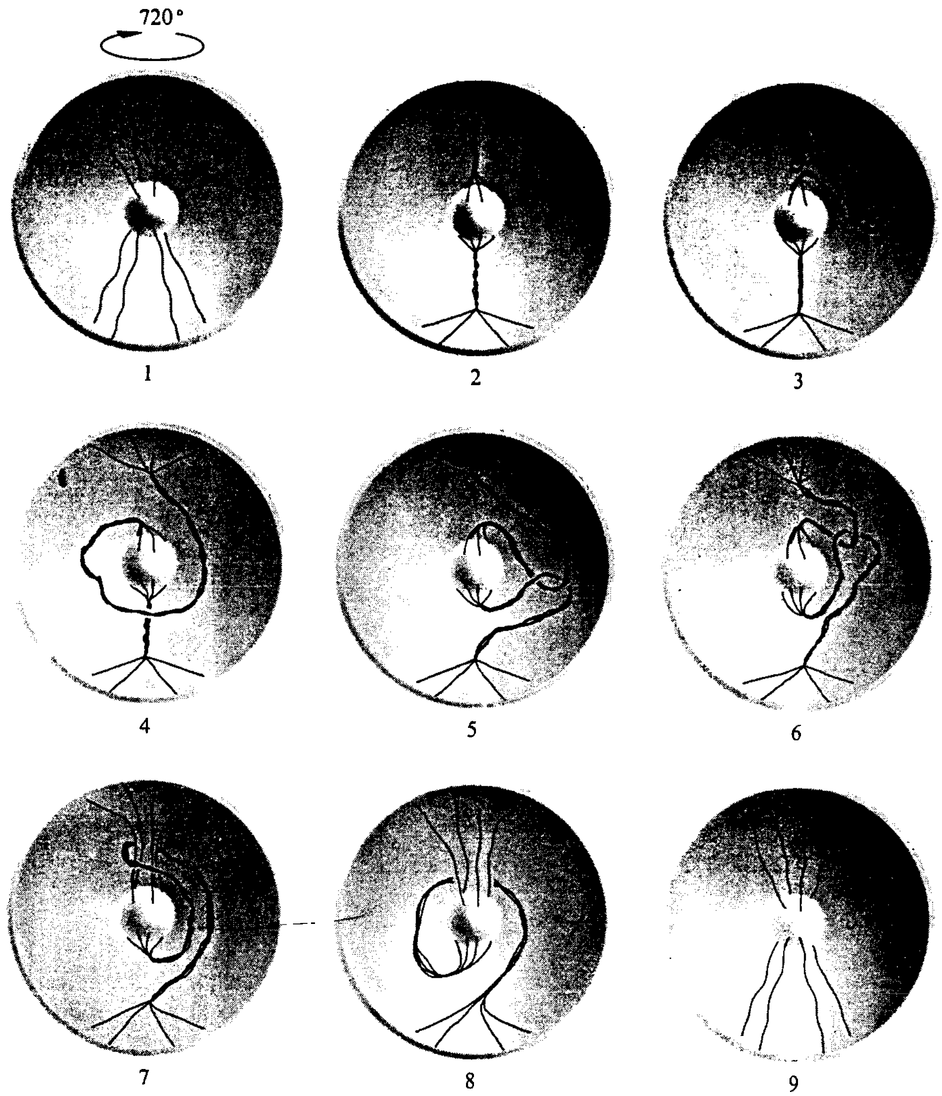

Figure 41.6.
An object is connected to its surroundings by elastic threads as in Figure 41.5. (Eight are shown here; any number could be used.) Rotating the object through 720° and then following the procedure outlined (Edward McDonald) in frames 2–8 (with the object remaining fixed), one finds that the connecting threads are left disentangled, as in frame 9 (lower right).

Such a quantity is known as a spinor. A spinor reverses sign on a 360° rotation. It therefore provides a reasonable means to keep track of the difference between the two inequivalent versions of the cube. More generally, with each orientation-entanglement relation between the cube and its surroundings one can associate a different value of the spinor ξ. Moreover, there is nothing that limits the usefulness of the spinor concept to rotations. Also, for the general combination of boost and rotation, one can write

Lorentz transformation of a spinor

$$\xi \longrightarrow \xi' = L\xi. \tag{41.51}$$