

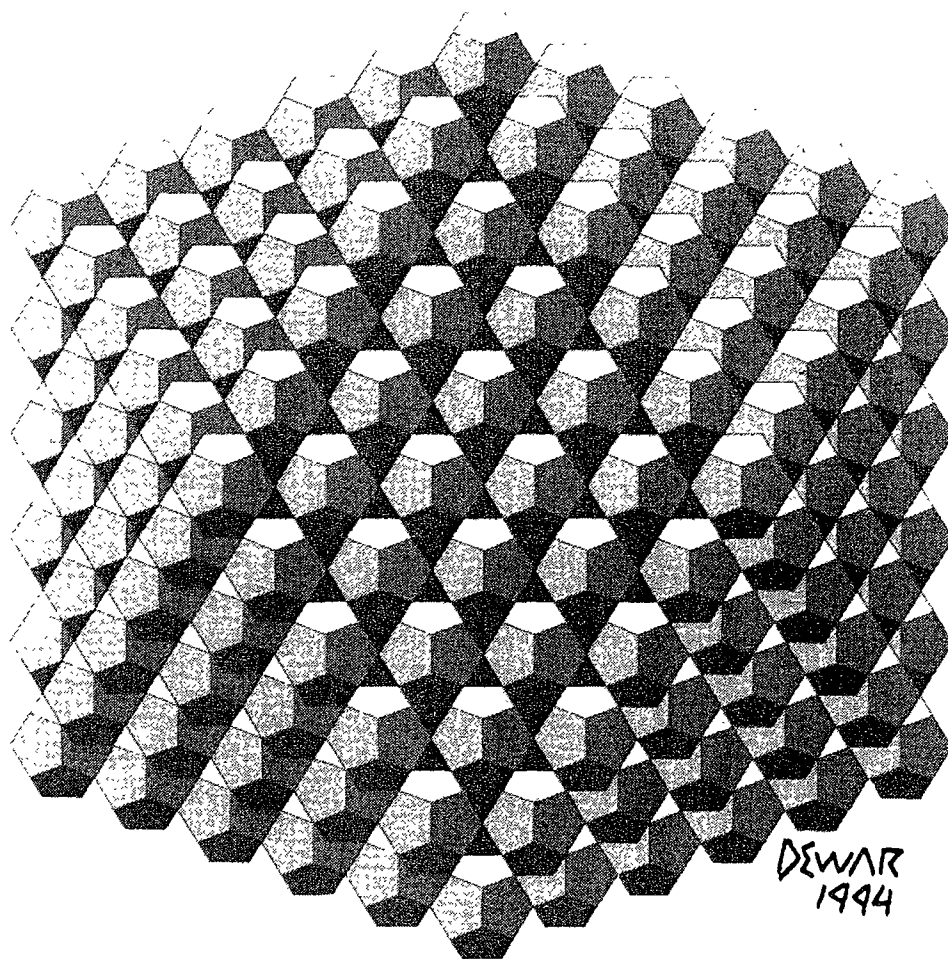
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**ENGLISH COUNTRY DANCE AS A LIVING TRADITION
VIEWED THROUGH SYMMETRY AND SYMMETRY-BREAKING**

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English Country Dance (ECD) is social dance which figures in the writings of authors such as Pepys, North, Austen, Dickens, and Hardy, and is well-documented from the 17th through the 20th century in published dancing-manuals. In earlier periods it functioned as courtship ritual as well as aristocratic play. It survived in rural settings in Britain into the 20th century when a revival of interest in folk arts brought it back to urban centers. Currently it serves as a social recreational activity, principally in Great Britain, Belgium, the Netherlands, the United States, and Canada. Early descriptions of ECD, apart from their evocations in novels and diaries, are characterized by their incompleteness, ambiguity, and "insider" nature. By analyzing ECD in terms of symmetry and symmetry-breaking, we do not attempt to remedy earlier problems of dance description, but we do provide another perspective on this rich and living tradition.

Most of the dances in the ECD tradition pair up dancers as couples, conventionally consisting of a man and a woman. In these dances there are sets for a fixed number of couples and sets "for as many as will", in the words of the old dancing books. Fixed-sized sets may have two to six, or occasionally more, couples; three is probably the most common of these, with two and four also found frequently, while other numbers are less commonly encountered. Dances for an arbitrary number of couples may be in long lines of men facing women, called *longways sets*, or they may be in circles with all of the dancers facing inward, alternating gender, or they may form two concentric circles, one of men and one of women facing each other. Yet another common form, called a Sicilian circle, has subgroups, called *minor sets*, of couple facing couple in a large circle. Several of the

other set configurations also have a similar division of the entire set (called the *major set*) into minor sets.

That various kinds of symmetry are important in these dances is immediately evident from the descriptions above: even before we have reached the level of describing dance figures, two symmetry-breaking terms have been invoked: *gender* and *facing*. Distinguishing between sexes means that exchanging roles with a dancer of the opposite sex will require, in general, making other changes in the figures. The concept of a dancer facing in a particular direction establishes a preferred direction for that dancer, breaking the two-dimensional spatial symmetry that might otherwise characterize the dance space.

More profound, however, are the general symmetry properties of space and time. The presence of a non-negligible gravitational field breaks the isotropy of space in a manner of utmost importance to dance. This field gives meaning to the word *down*, and the fact that any motion by a dancer opposite to this direction is countered by gravitational effects, and indeed, in a time approximately equal to the shortest time used by dancers for the individual moves which make up the figures. This is not a coincidence: that shortest time is the time for a single step, and a step is the result of raising ourselves up on one foot while leaning forward (usually) while swinging the other foot out in the direction which we are leaning, before the effects of gravity dominate and bring us crashing to the floor. The time that it takes for this second foot to touch after being lifted defines the basic time unit for the dance, and if a sequence of such steps is made one right after the other, a tempo is established. There is surprisingly little variation in tempo from one dance to another. When one thinks of what makes up dance, steps often play a major role.

Other spatial considerations derive from *The Presence*, which in the earlier times would be the lord and lady of the manor or a higher-ranking visitor. The musicians would generally be in this area, too, and these days the musicians usually play this role. Sets are oriented in a more-or-less standard way relative to the Presence if they are longways sets (*i.e.* sets in lines), so that one end of the lines is closer, and this end of the set is called the *head* of the set; the other end is the *foot*. The direction toward the head is called *up*, and the opposite *down*. Thus spatial symmetry is broken yet again in

the two-dimensional space of the dance figures. One's own orientation is now defined relative to the orientation of the set. The two sides of the set are often identified as the men's and the women's sides of the set and thus spatial symmetry becomes coupled with differences of gender.

Since the time coordinate is one-dimensional, symmetry possibilities are more limited than are spatial ones. Mirror symmetry or time reversal is violated generally by our sense of the passage of time, but that does not prevent at least parts of dances being structured symmetrically with respect to time-reversal. Translational symmetry however is possible at many levels, and is a most important component of the dance, starting with the establishment of a basic tempo as has already been mentioned. Various multiples of this basic time unit may provide the basis for a translational symmetry operation at some level within the dance, and many of these relate to spatial symmetry as well as temporal.

Within this general spatial and temporal framework the dancers, caller, musicians, and spectators experience the dance in their own unique ways. From the viewpoint of the dancers, the symmetries and asymmetries within their minor set are, in general, more significant than those associated with the major set or with the space in which the dance takes place. The dancers remember the structure of the dance primarily in terms of what happens in the minor set. Symmetry, and how it changes from one part of the dance to another, relates mostly to this minor set. Thus, while there is no rotational symmetry for the major set, there will be for the individual minor sets in a number of the moves which have symmetry about a vertical axis in the center of each minor set. Similarly, the translational symmetry ever present in the longways major set and in circle sets is not one that affects the dancer directly, only as it is coupled with a temporal translational symmetry or periodicity. Dancers are acutely aware of the music (ideally as much as of the other dancers around them) and will recognize and respond to symmetry in the music as much as the dance choreography allows. Thus, not only the repetition of the tune in its entirety, but the repetition of sections, phrases, and individual motifs will suggest corresponding repetition of movement to the dancer.

While the individual dancers perceive symmetries from their particular roles in the dance, a caller sees it from the point of view of all the dancers simultaneously. The caller sees the symmetry

in the minor sets in the context of the larger set, and may recognize from some unexpected symmetry breaking that something is wrong. Understanding the symmetries that the dance possesses and utilizes helps the caller not only to teach the dance with a minimum of time and effort, but also to keep track of what individuals are doing relative to those around them. A caller may be acutely aware of the symmetries that should be present in the major set but for some reason aren't, and may make efforts to bring this to the dancers' attention.

Musicians see yet another viewpoint, usually dominated by a view of the heads of the sets, but their main concern is making danceable music. This also involves breaking translational symmetry in ways that may be fairly subtle to the dancers. The musicians may ornament, pass the melody around, introduce countermelodies, alter the harmony, the instrumentation, the modality, the key, and even change to a different tune, but all in such a way that the dancers know, or at least can find, where the dance moves belong in the music.

As for spectators, those from a raised vantage point have an excellent view of the dance moves, the configurations in major and minor sets, and the flow of the figures with the music. But, while this can be highly pleasurable, it is in a way the least satisfactory position of all, because it is the least involved. The purpose of this kind of dance is to involve people, to get them to experience the music as a dancer. The best position is that of a dancer who can visualize and appreciate the dance while dancing.

In the paper we present as well figures from a characteristic dance chosen from each of three historical periods of ECD. These include the Playford era (*ca.* 1650-1828), the traditional period (late 19th — early 20th century) and the modern era. In all periods symmetry is used extensively in the structure of ECD. However, it is symmetry-breaking within this structure that provides much of the aesthetic, emotional, and physical pleasure.