TRANSLATING 'VECTOR SYMBOLS' FROM LABAN'S (1926) *CHOREOGRAPHIE*

by

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A group of notation symbols were experimented with by Rudolf Laban (1926) in his early German work *Choreographie* but were not used subsequently during the development of choreutics and Kinetography Laban (Labanotation). This paper presents details of a step-by-step process of translating these early symbols into modern-day Labanotation direction symbols. To anticipate, it is found that these early symbols represent orientations of lines-of-motion without any reference to locations, coordinates, or points in space. Thus, for convenience they are referred to here as 'vector symbols', noting that Laban (1926) did not designate any name (Fig. 1). These early vector symbols are then considered as to what they reveal about Laban's choreutic conception of spatial harmony when it was still embedded within the notation system.

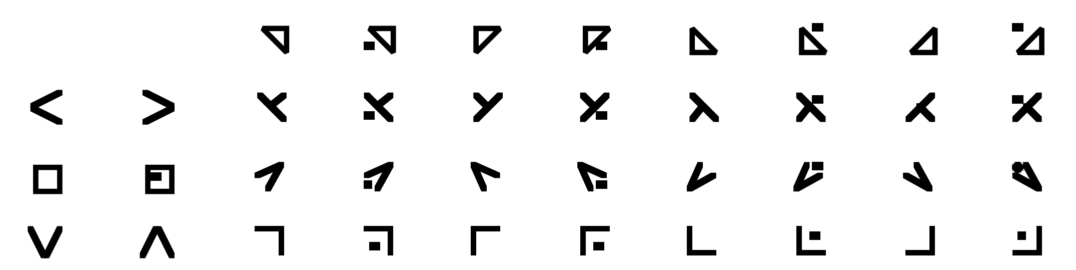


Figure 1. Early symbols used in Laban's (1926) *Choreographie*.

Laban (1926, pp. 20-21, 35, 44-45, 47, 50–53, 72) uses these early vector symbols in several different spatial sequences. Some of these are well-known today, having reappeared in more recent books, while other sequences are obscure as they do not appear to have been published anywhere else. All of the sequences were translated as part of this research, however only five examples are taken in this paper as sufficient to illustrate the translation of these symbols into Labanotation direction symbols.

The choreutic 'axis scale' is taken as the first example which Laban (1926, p. 44) notates with the early vector symbols, as well as with 'inclination numbers'. The meaning of the inclination numbers can be verified as being based on the 'A–scale' and 'B–scale' (Fig. 2) and the spatial sequences of the axis scales are well known (Bartenieff & Lewis 1980, p. 44; Preston-Dunlop 1984, p. 39). Therefore, this allows an easy translation of the vector symbol axis scales sequences into Labanotation direction symbols (Fig. 3).

From this translation of the axis scales it could be concluded that each vector symbol has a one-to-one correspondence with an inclination number. In this case each vector symbol would represent one particular 'transverse inclination' [2,3] from the A-scale or B-scale. However, the next translation shows this conclusion to be inadequate.

In most of the notations it is specified that the symbols are read in columns from the bottom to the top (Laban 1926, p. 47). In the sequences of "Scales combined from primary-directions in four diagonals over all 24 directions"[4] (Laban 1926, p. 52) the first column can be taken as an example (Fig. 4a, b, c). For the first-half of the column the

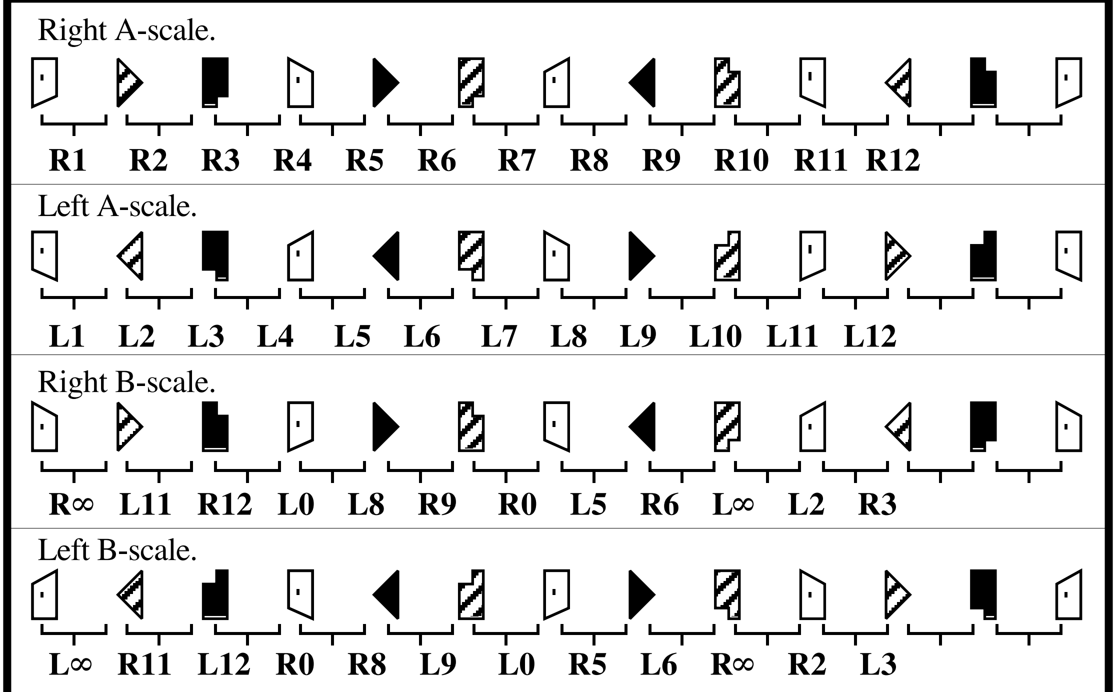


Figure 2. Inclination numbers translated into Labanotation direction symbols, based on the choreutic A–scales and B–scales (read from left to right) (Laban 1926, pp. 29-32; Ullmann 1966, pp. 156-162).

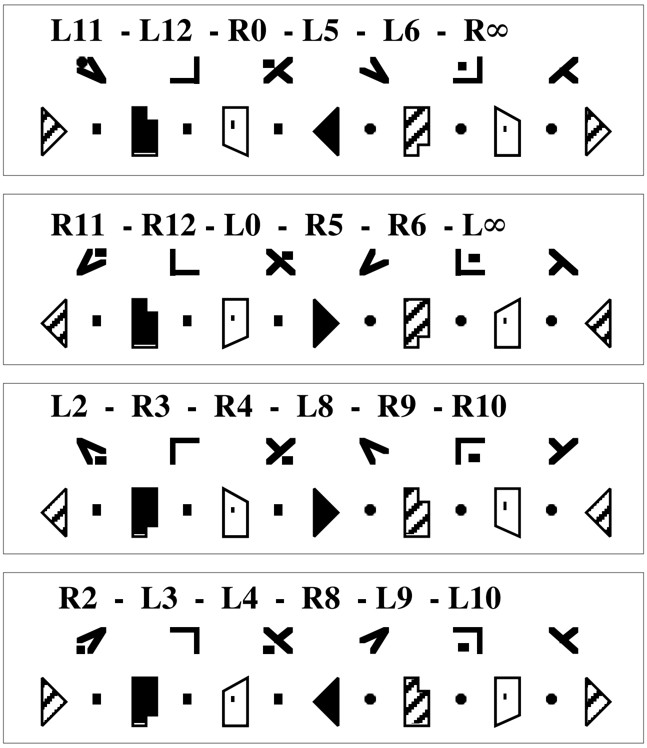


Figure 3. 'Axis scales' notated with inclination numbers and vector symbols (Laban 1926, p. 44) and translated (here) into Labanotation direction symbols (read left-to-right).

Figure 4a, b, c.
"Scales combined from primary-directions in four diagonals over all 24 directions"(Laban 1926, p. 52).

Figure 4a.
An attempt to translate vector symbols according to inclinations from the choreutic A–scales and B–scales.

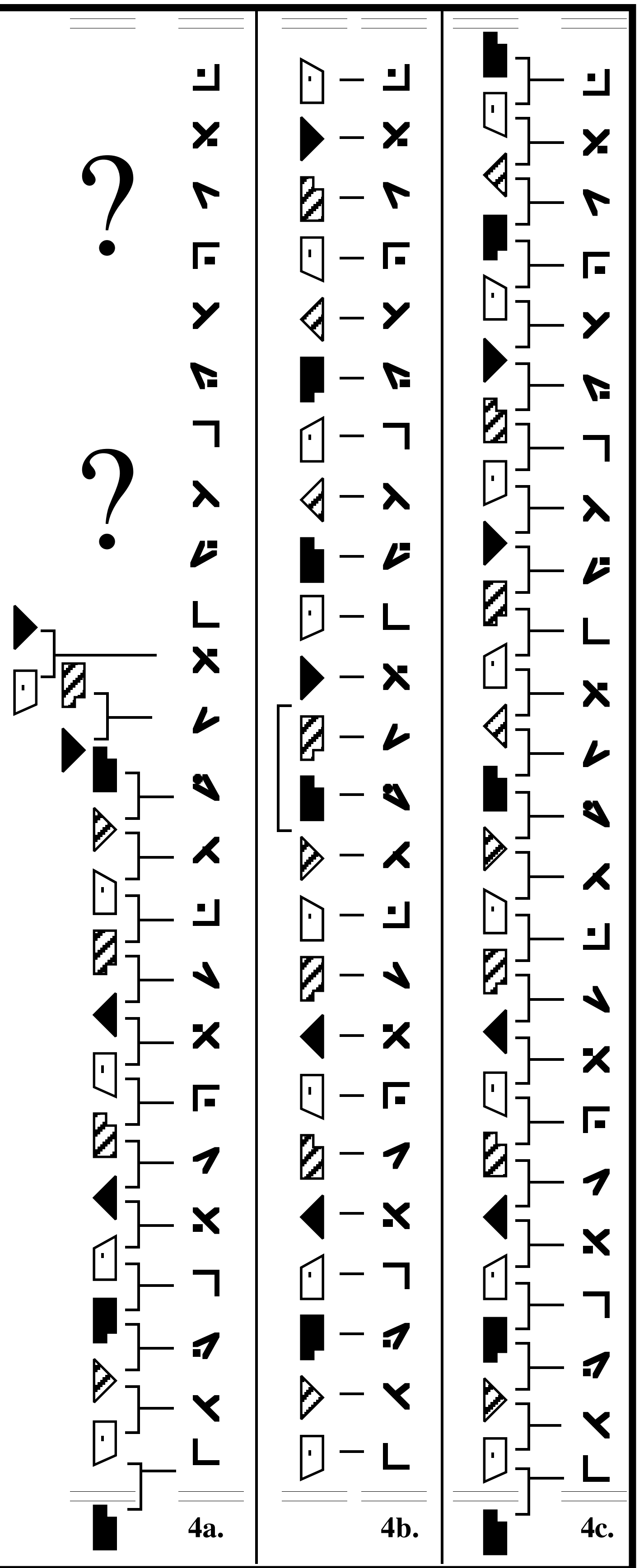
Halfway through the sequence, this translation is no longer adequate since extra transition moves would be required.

Figure 4b.
An attempt to translate vector symbols into end-points (locations) of inclinations.

This is not adequate since two vector symbols would be translated into each direction symbol, and halfway through the sequence a planar central diameter occurs, rather than the inclinations throughout the rest of the sequence. This pattern is not typical of choreutic 'scales'.

Figure 4c.
A translation of vector symbols according to 'natural order' inclinations from the A–scales and B–scales, as well as their retrograde 'counter order' inclinations

The resulting sequence is typical of choreutic scales and so appears to be the correct translation.



translation of each vector symbol into one particular A–scale or B–scale inclination is perfectly satisfactory. However, in the second-half of the column this translation is no longer adequate since each new inclination does not begin at the point where the last one finished (Fig. 4a). Thus, to follow this translation an entire series of transitionary movements would be required in the second half of the column, but not in the first.

As an alternative translation, the early symbols might indicate only the end–position of a particular inclination. However, this translation is also not satisfactory for two obvious reasons (Fig. 4b). Firstly, this translation would mean that two different vector symbols are both translated into the same Labanotation direction symbol (eg. Fig. 3 uses 24 vector symbols but only 12 Labanotation symbols). Secondly, this translation would yield a series of transverse inclinations with one central diameter halfway through the sequence. This does not follow the typical pattern of choreutic 'scales' which usually contain a series of identical types of paths (eg. all transverse inclinations) or a repeating series of different types of paths (eg. transverse, peripheral, transverse, etc.).[5]

Another possibility for translating this notated sequence is to allow vector symbols to also be translated into inclinations progressing in 'counter order' [6] as opposed to the hypothesised "natural order of succession" (Ullmann 1966, p. 152) according to which transverse inclinations progress most easily through the anatomical Cartesian planes in the order: frontal, medial, horizontal, frontal, etc. (eg. the A-scales and B-scales use only this 'natural' planar order; see Fig. 2). When the vector symbols are translated into both 'natural order' and also 'counter order' then this sequence yields a pattern of all transverse inclinations which ends at the same location as it begins (Fig. 4c). These are typical characteristics of choreutic scales and so indicate that this is the correct translation.

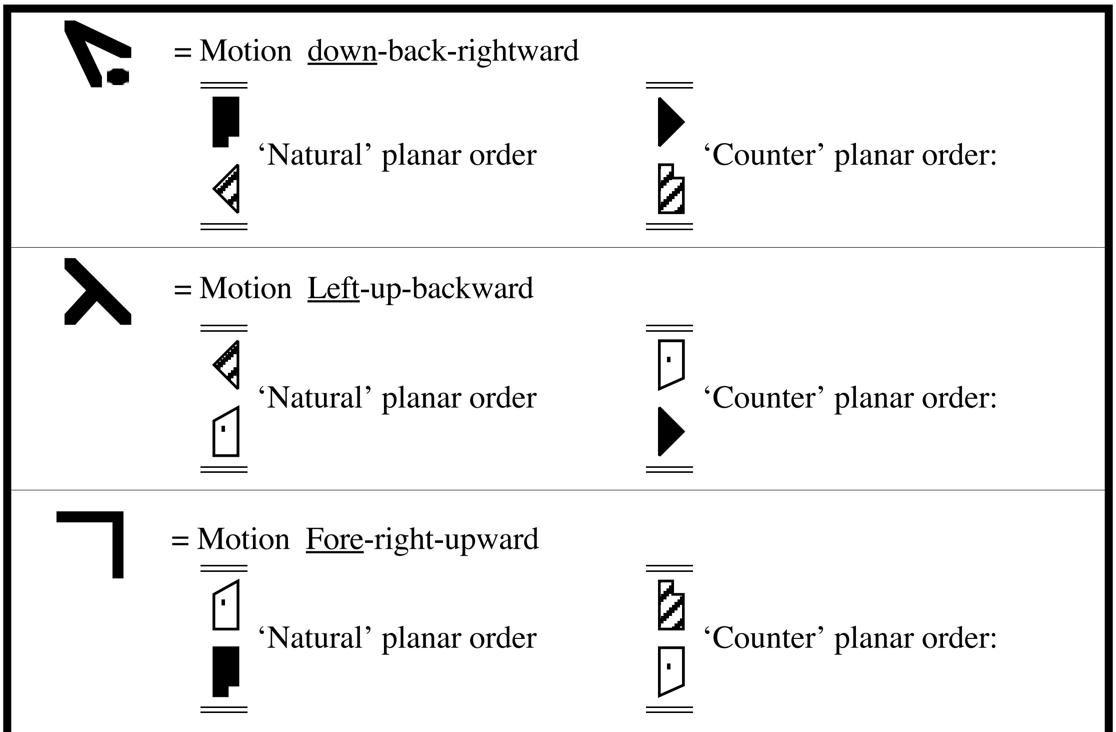
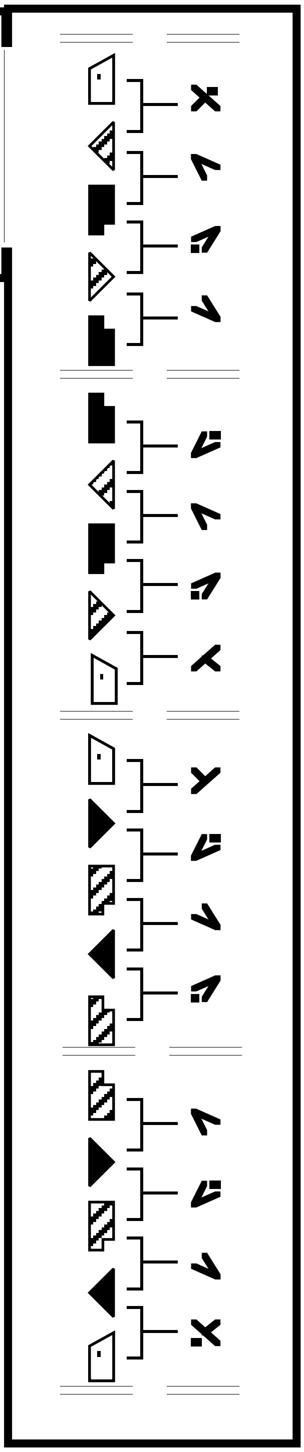


Figure 5. Indeterminate location of vector symbols. Examples here illustrate how the same vector symbol can be translated into either 'natural' or 'counter' planar orders. These two translations will be in different spatial locations but will have exactly the same orientation (parallel) (direction symbols read bottom-to-top).

Figure 6. “Augmented three-rings or double-volutes with one action-swing-direction” (Laban 1926, p. 72).

Here, vector symbols translate satisfactory into both the hypothesised ‘natural’ planar order (frontal-medial-horizontal-frontal etc.), and also the ‘counter’ planar order.



From these two examples so far it could be concluded that vector symbols can be translated as transverse inclinations in either natural order or counter order. This means that a particular vector symbol might on one occasion be translated as a movement in one area of space (natural order inclination), while on a different occasion the same vector symbol might be translated as a movement in a different area of space (counter order inclination). What is equivalent about the two movements is that they are both in the same orientation, moving in the same direction, that is, the lines-of-motion are parallel (Fig. 5).

This translation can be further confirmed in a third example from the notation “Augmented three-rings or double-volutes with one action-swing-direction” [7] (Laban 1926, p. 72). When both natural order and counter order inclinations are used then the translation displays a high degree of symmetry typical of choreutic scales (Fig. 6).

In the examples so far, vector symbols have only been translated into ‘inclinations’, a term coined by Laban to refer to lines-of-motion in 3D orientations but at irregular angles to the vertical (ie. not at pure 45º, see notes 2 & 3). However, in the next example “Combined scales from primary-directions with dimensions and volute-links which are traversed twice” [8] (Laban 1926, p. 53) vector symbols are also used for dimensionally oriented movements. When the translation uses transverse inclinations in both natural order and counter order, as well as transverse dimensional movements, then the sequence displays the high degree of symmetry typical of choreutic scales (Fig. 7). Notice that these are not dimensional end-positions (orientations of limb positions, as in modern-day Labanotation), but are dimensional lines-of-motion.

This expands the translation of vector symbols to include both inclinations and dimensions which are transverse (see notes 2 & 3). In the next example “Exercise for bodily practice: Scales assembled from short peripheral directions”[9] (Laban 1926, p. 47), just as stated in the title the only satisfactory translation is arrived at when vector symbols are used for inclinational and dimensional lines-of-motion which are ‘peripheral’ (Fig. 8). It should be noted that this translation of vector symbols into both transverse and peripheral motions only makes sense when an icosahedral-shaped ‘scaffolding’ is used. In this type of icosahedral kinespheric network the transverse and peripheral orientations will be exactly parallel, and this parallelism is a crucial aspect in the formulation of choreutic scales (Ullmann 1966, p. 172). In a cubic (cuboctahedral) kinespheric network (as in modern-day Labanotation) this same parallelism does not occur.[10]

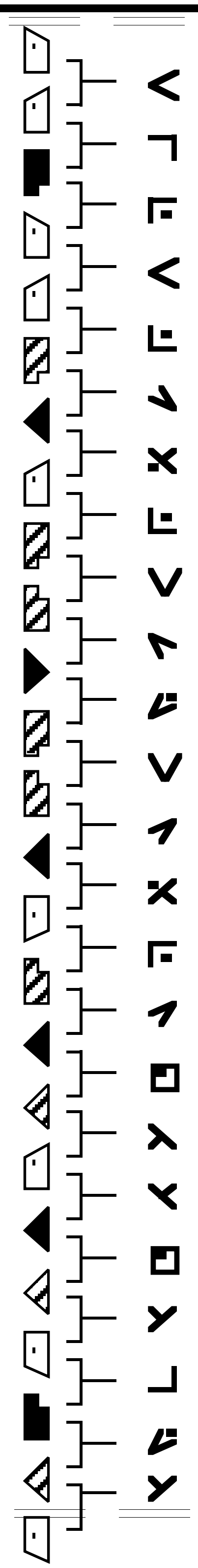


Figure 7. “Combined scales from primary-directions with dimensions and volute-links which are traversed twice” (Laban 1926, p. 53).

Here, vector symbols are also used to indicate the orientation of dimensional movements, rather than dimensional end-positions.

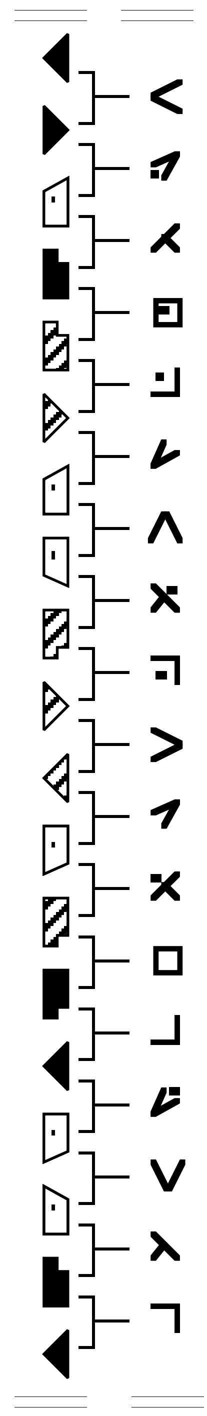


Figure 8. “Exercise for bodily practice. Scales assembled from short peripheral directions” (Laban 1926, p. 47).

Here, vector symbols are used for both inclinational and dimensional movements on the periphery of the kinesphere (note that this distinction between peripheral versus transverse dimensions, and the 3-dimensional orientation of peripheral inclinations are only valid for an icosahedral-shaped kinespheric scaffolding; see note 10).

Similar types of symbols are also used for eight diagonal directions (Fig. 9). These are presented together with dimensional symbols alongside drawings of a human figure inside an octahedron and a cube (Fig. 10) (Laban 1926, pp. 20-21). These kinespheric networks seem to suggest that the dimensional and diagonal symbols represent locations for limb positions (as in Labanotation). However, it has already been shown in the examples presented so far that the dimensional symbols [11] are used to represent dimensional lines-of-motion rather than dimensional end-positions (see Figs. 7 & 8). The diagonal symbols are not used in any of the notated sequences but since they have the same symbol-structure as the dimensional and the inclinational symbols it is consistent to include these all together within the same family of vector-type symbols.

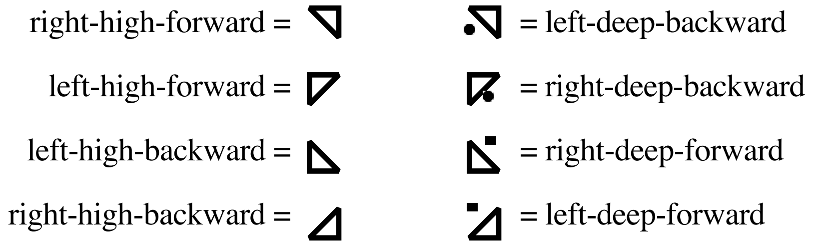


Figure 9. Diagonal symbols from *Choreographie* (Laban 1926, p. 21) are listed once but not used in any of the notated spatial sequences.

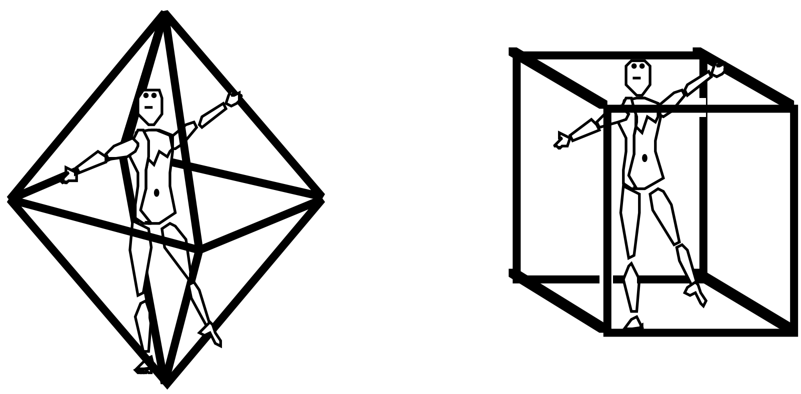


Figure 10. Octahedral and cubic ‘scaffolding’ (grids, networks) (in the style of Laban 1926, pp. 20-21). These seem to indicate that the symbols refer to locations in these kinespheric grids, however in the notated spatial sequences they are used as vectors (lines-of-motion) rather than locations in a network.

Thus, from the examples presented here it can be concluded that this collection of 38 symbols can be deciphered as representing orientations of lines-of-motion but without indicating any particular locations or limb positions. Thus they might be referred to collectively as dimensional, diagonal, and inclinational vector symbols (Fig. 11) (notice there is not any vector symbol for centre, or ‘place middle’, since this is not a motion).

Two characteristics can be highlighted about the spatial representation embedded within vector symbols. The first involves the explicit representation of motion with particular locations being indeterminate. The second involves a heuristic method of prototypes and deflections for spatial cognition. What is interesting about these is not just their different method for movement notation, but their significance is that they give an indication about Laban’s underlying mental conception of body–space during his early formulations of movement analysis and kinetography.

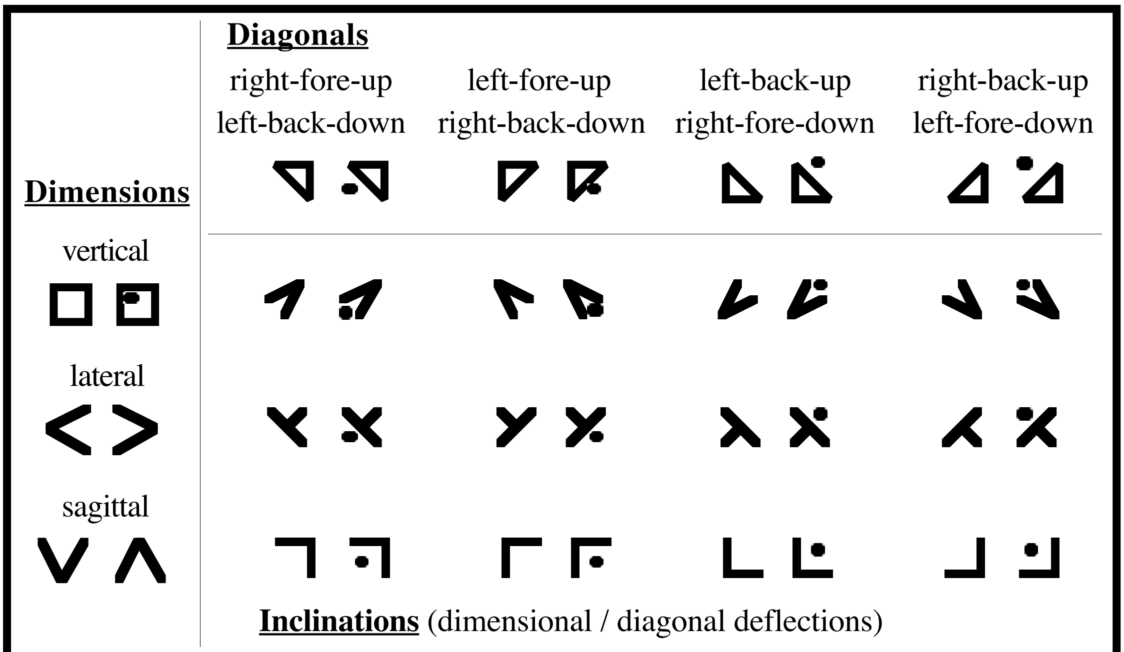


Figure 11. Entire collection of 'vector symbols' for dimensions, diagonals, and their deflecting inclinations (Laban 1926).

Vector symbols represent the orientation of lines-of-motion explicitly, without referring to any particular positions or locations of body parts. This is in contrast to modern-day Labanotation or Benesh notation which typically represent motions implicitly as transitions from position to position (Hutchinson 1970, pp. 29, 118; Benesh & Benesh 1969, p. 24). This highlights a fundamental distinction between definitions of 'direction'. On the one hand, a 'direction' might be toward a particular point (eg. directions north and south) in which motions toward the same direction will converge towards a location. On the other hand, a 'direction' might be along a particular angle or orientation without a defined end-point (eg. directions west and east) in which case motions in the same direction do not converge but remain parallel.

Other vector-type symbols have occasionally been used in other places. Hutchinson Guest (1983, p. 261) devised symbols for "direction of the progression", allowing any Labanotation direction symbol to be modified with an arrow to indicate the orientation of a line-of-motion rather than a limb position (Fig. 12).

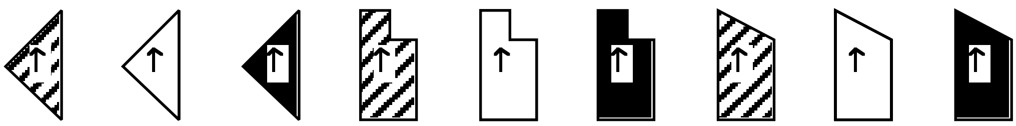


Figure 12. Examples of symbols for "direction of the progression" (Hutchinson Guest 1983, p. 261).

Laban (1966, pp. 125-132) used another vector-type notation referred to as "symbols of free inclinations" (p. 129) or "free notation" (p. 130) and used to represent "free space lines" (p. 125) and "free trace-forms" (p. 128). These "may occur at any place, either inside or outside the kinesphere without being bound to the points of the scaffolding" and are described as "an old dream in this field of research" (perhaps a reference to the earlier method in *Choreographie*) but which is left for the "future development ofkinetography"

(p. 125). These symbols represent inclinations by using diagonal direction symbols together with small letters to indicate the inclination's primary dimensional component which 'deflects' the diagonal (f = forward, etc.) (Fig. 13). An initial location must be taken as the starting point, then the symbols indicate only the distance and the line of direction (relative to the vertical line of gravity and the forward facing of the body) without regard to any particular locations. The notion of 'free' seems to indicate an attitude of motion, being free from constraints of a rigid scaffolding.

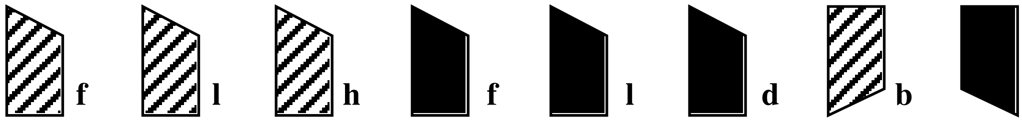


Figure 13. Examples of symbols for "free inclinations" (Laban 1966, pp. 127-128).

In both of these cases it is modern-day Labanotation direction symbols which are modified slightly to indicate motions rather than positions. Therefore, these methods preserve the conception of spatial directions which is embedded within Labanotation, namely, dimensions, planar diagonals (diameters), and 3D diagonals. In contrast, the most frequent direction in the vector symbol system is the inclination. This difference in conceptual systems can be seen in how inclinations are difficult to represent, and thus difficult to mentally conceive, in Labanotation, requiring either a transition between two position-based direction symbols, or by using "intermediate directions" (halfway or third way points) (Hutchinson 1970, pp. 437-440) (Fig. 14).

Obviously the collection of vector symbols is designed at its basis to document movement according to very different categories than Labanotation direction symbols are designed to do. The vector symbol method highlights the conception of inclinations as being a fundamental category for analysis of body motion whereas in Labanotation this category of inclinations is obscure.

This principal use of inclinations within the vector symbol method highlights a feature of Laban's choreutic conception of spatial harmony known as the theory of 'deflections'. This asserts that actual body movements do not occur as pure dimensions or diagonals, or along Cartesian planes, but tend to 'deflect' into irregular orientations which Laban termed 'inclinations'. Deflection theory is described in many places as a core principal of choreutics (Bartenieff & Lewis 1980, pp. 33, 89-91; Laban 1966, p. 101; Ullmann 1966, pp. 139, 141, 143; 1971, p. 17). The fundamental rationale for the theory comes from an analysis of anatomical structure and kinesiological constraints governing which movements are physically possible for the human body to produce (Laban 1926, p. 25; 1966, pp. 16, 84, 101, 105-106; Bartenieff & Lewis 1980, pp. 32-33, 89).

A kind of memory heuristic is devised to allow for easy mental conception where dimensions and diagonals are taken as conceptual prototypes while these irregularly deflecting inclinations are conceived according to their relationship to the prototypes. Laban (1966) identifies pure dimensions and pure diagonals as prototypes in that they are "easiest to visualize" (p. 11), the "norm" (p. 15) and can be considered as "basic elements of orientation" (p. 11) and the "fundamental cross-sections of space" (p. 118) (ie. Cartesian cross). In contrast, inclinations are conceived according to their relationship to the prototypes by considering them to be "a digression from the given norm" (Laban 1966, p. 15), and as "deflections", "deviations", "influenced by", "derived from", "replacing", "transformations of", as a "harmonic mean" between, and as "modified" or a "variation" of dimensions and diagonals (Bartenieff & Lewis 1980, p. 43; Dell 1972, p. 10; Ullmann 1966, pp. 145-148; 1971, pp. 17, 22; Bodmer 1979, p. 18).

Deflecting inclinations are conceived to be a sort of average, or compromise, between the contrasting prototypical tendencies of dimensional stability versus diagonal mobility (or lability) (Laban 1966, pp. 88-90):

> Since every movement is a composite of stabilising and mobilising tendencies, and since neither pure stability nor pure mobility exist, it will be the deflected or mixed inclinations [mixtures of dimensions and diagonals] which are the more apt to reflect trace-forms of living matter. (Laban 1966, p. 90)
>
> Deflected directions are those directions which, in contrast to the stable dimensions and to the labile diagonals, are used by the body most naturally and therefore the most frequently. In these deflected directions stability and lability complement each other in such a way that continuation of movement is possible through the diagonal element whilst the dimensional element retains its stabilising influence. The deflected directions . . . are easily felt because they correspond to the directions natural to the moving body. (Ullmann 1966, p. 145)

Vector symbols are organised in accordance with the theory of deflections. Symbols are included only for pure dimensions and pure diagonals (prototypes), and for inclinations (deflections). Notice how there are not any symbols for ‘diameters’ (2D planar diagonals). This omission may be because diameters are considered to be ‘deflections’ in themselves [12] and so would be expected (according to deflection theory) to continue their deflecting process into a 3D inclination.

Thus, the collection of vector symbols appear to provide a heuristic (rule of thumb) for the perception and memory of the spatial orientation of body movements. The memory heuristic is organised according to an economical system of landmarks (prototypes) and variations (deflections). Body movements are assumed to be deflecting into 3D orientations, these might be at an infinite variety of irregular angles. Pure dimensional and pure diagonal orientations are taken as the most regular, simple, symmetric divisions of 3D space (Cartesian coordinate system). These are the rational, idealised, prototypical concepts for labeling, categorising, and remembering spatial orientations. The actual stuff of body movements (according to deflection theory), the irregularly oriented inclinations, are then mentally conceived according to their relationship to the prototype concepts of dimensions and diagonals. This is the ingenuity of the vector conception, that the infinite number of possible deflecting orientations are conceptualised in an economical system based on 8 diagonal directions, each deflecting along 3 possible dimensions, yielding a total of 24 possible categories of inclinations. This provides cognitive economy in that an infinite number of possible deflecting orientations can be perceived and remembered easily by categorising them according to a small number of simple prototypes.

Conceiving of the 24 inclinations as categories, rather than as exact orientations, allows a broader approach to the vector symbols than is explicit in *Choreographie*, however the need to represent an infinite variety of inclinations is pointed out in Choreutics (Laban 1966, pp. 17, 128). Exact orientations of body movements might vary considerably within each category of inclination, while still remaining within the range of a particular diagonal deflected by a particular dimension. They might also vary according to their situation in the kinesphere, being either central, peripheral or transverse. This conception allows the 24 inclinations, considered as categories, to economically represent the infinite variety of body movement orientations (see examples in Fig. 14).

Memory organisations based on prototypes and variations are common in other areas of spatial cognition (visual space, audio space) where heuristics (rules of thumb) are used to perceive and remember a wide diversity of information according to a small number of simple prototypes. The economy of this organisation brings ecological advantage since it allows environmental stimuli to be perceived, recognised, and acted-on quickly, even at the risk of making small errors which inevitably arise because events tend to be perceived and remembered as being more similar to a prototype than they actually are.

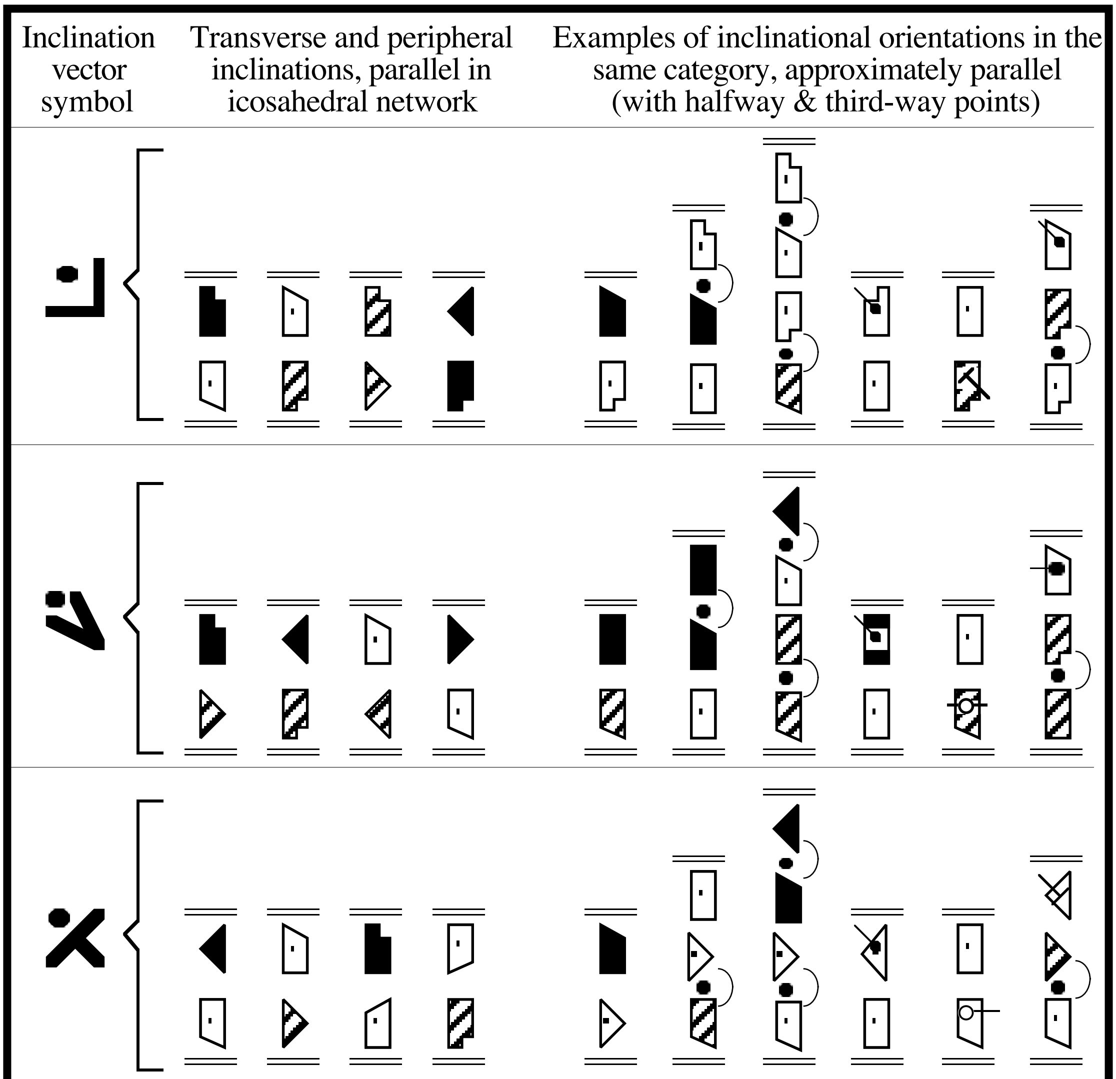


Figure 14. Representation of inclinations with vector symbols and in Labanotation symbols as parallel and approximately parallel inclination categories.

For example, spatial locations and orientations, sizes of angles, etc. typically tend to be remembered as being more closely Cartesian (pure vertical & horizontal) or more along a pure 45° diagonal than their actual orientations and locations (Byrne 1979; Huttenlocher, Hedges & Duncan 1991; Lynch 1960; Moar & Bower 1983). These types of effects indicate how Cartesian orientations provide cognitive reference points used in memory heuristics (Rosch 1975; Tversky 1981). This bias toward dimensional or diagonal prototypes is a typical effect in visual spatial perception observed by Gestalt psychologists (Wertheimer 1923, p. 79) and has been identified as influencing visual arts where irregular orientations tend to be perceived as the most dynamic, as if they are in motion, striving toward a nearby, more prototypical, dimensional or diagonal (Arnheim 1974, pp. 10–16, 426–429).

These characteristics have been primarily studied in visual space, yet similar cognitive structures would be expected for perception and memory of body movements since all spatial cognition is inextricably tied to kinesthetic-motor space through the physical actions involved in spatial tasks and spatial learning (Piaget & Inhelder 1967; Baddley 1986, pp. 118-119). Similar effects occur in Labanotation practice (Jarrell 1992) where direction symbols which are dimensional seem to be read more quickly and easily than direction symbols for other orientations, while actual body movements tend to spontaneously deflect away from the pure dimensional directions. In the simplest examples, arm circles in the medial plane tend to bulge outwards and in the frontal plane tend to deviate forwards (Fig. 15). While Cartesian planes may be simpler for mental comprehension, deflecting plastic shapes are most readily produced by the body.

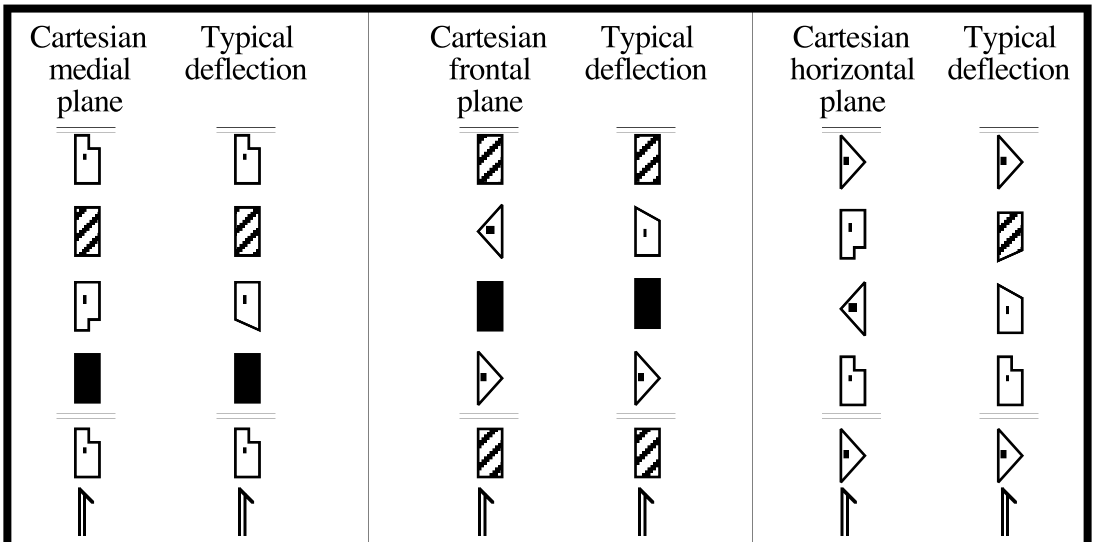


Figure 15. Typical deflections of Cartesian planes. Further deflections are likely to occur, these being the most simple. This deflecting process is used as a principal in deriving choreutic inclinations (Ullmann 1955; 1971, pp. 22-26).

Indeed, even when the ‘same’ movement is repeated, its form and orientation will vary at least slightly from one performance to the next. Because of variability in muscular forces applied, mass of body-parts and objects moved, viscosity of joints, the movement will never be repeated exactly the same. In a striking parallel to Laban’s conception of deflections, these continually shifting forms of movement behaviour have been characterised by the famous Russian motor control and cybernetics researcher N. Bernstein (1984, p. 109) as the “co-ordinational net of the motor field . . . as oscillating like a cobweb in the wind”. What emerges here is a model of the kinespheric scaffolding, not as a rigid fixed coordinate structure, but as an elastic stretchable net, continually modifying and deflecting to the particular circumstances of the moment.

These types of deflections are described in the rationale for the choreutic conception of inclinations (Ullmann 1955; 1971, pp. 22–26). Deflecting directions are also used to organise the system of choreutic scales where inclinational scales (eg. A-scale, B-scale) are created as deflected variations of scales with Cartesian directions (eg. dimensional scale) (Laban 1926, p. 25; 1966, pp. 42, 80). This explicit practice, for example of deflecting the dimensional scale into the A-scale, was also part of Laban’s dance training method as taught in England during 1948-1949 (Preston-Dunlop 1996).

This prompts the question of why, in the notation system, Laban abandoned (or set to the background) these two features of the explicit representation of motion, and the heuristic method of prototypes and deflections. Perhaps the sheer conceptual difficulty in visualising deflecting inclinational motions led to the adoption of the more readily usable (easier to visualise) point-to-point, pose-to-pose conception of movement used in kinetography, and also in Laban's (1966 [1939]) next major work on choreutics.

However, it may be that the firm establishment of the position-based kinetography method can itself offer a theoretical foundation for the motion-based method. This researcher can only report from personal experience that, while initially more complex, with practice this motion-based 'vector' method of observing and embodying inclinational orientations of movement can be actually quite simple. Either the diagonal and/or the dimensional components of movement might be readily obvious (not the location moved to, but the orientation of the pathway itself). In some cases one of the components might be more subtle. When both aspects are identified they comprise the dimensional / diagonal deflection.

The vector conception offers notation symbols for motion, but it also offers an alternative conception of body space which can influence how a performer will conceive and experience one's own body movements. For example, while ballet movements are typically conceived as a series of dimensionally or diagonally oriented positions (Lepczyk 1992), Laban's (1926, pp. 6-19) approach demonstrates how deflecting inclinations can be identified within the transitional motions between these positions. This reveals a method for re-envisaging dance techniques according to a motion-based conception of deflecting inclinations.

The vector conception can also address issues in the point-to-point method of the modern-day practice of choreutics. What is often typical is that choreutic scales are taught to students according to the conception of a rigid kinespheric scaffolding in a 'reach to the points' fashion. This tends to promote performance of a single body-part leading the movement in a manner of 'tracing', often producing an isolated gesture disconnected from the rest of the body. This kind of space-tracing sometimes becomes a negative caricature of choreutic practice. As an alternative, using deflecting vectors requires a fundamental shift in perspective, abandoning (or being 'free' from) the rigid structure of the scaffolding. Rather than considering 'points in space', the orientation of lines-of-motion (of any body part, or the centre of gravity of a collection of body linkages) are regarded immediately as deflecting diagonals and dimensionals without being tied to any particular points or positions. Conceiving of continuously deflecting motions can assist in bringing greater organic embodiment to choreutic practice.

NOTES

1 This research was part of a Ph.D. degree at Laban Centre London, City University (Longstaff 1996, Section IVA & Appendix IX) and is in advance of an upcoming English translation and annotations of *Choreographie*, edited by J. Longstaff. Comments can be addressed to J. Longstaff; Laban Centre London; Laurie Grove, London SE14 6NH U.K. < j.longstaff@laban.co.uk >

2 The concept of a 'transverse inclination' can be described as follows: In choreutics, spatial forms (line, curve, loop, etc.) can be classified according to their situation relative to the centre of the movement-space (kinesphere), as either 'central' (passing directly towards or away from the centre of the space), 'peripheral' (situated along the edge of the space), or 'transverse' (cutting between the centre and the periphery) (Dell 1972, pp. 3-4; Preston-Dunlop 1984, p. viii).

The orientation of the spatial form can then be classified as either a 'dimension' (vertical, lateral, or sagittal), a 'diameter' (or 'planar diagonal', having a two-dimensional orientation, eg. up-right), a pure 'diagonal' (three-dimensional orientation with all three dimensional components equally stressed, eg. up-right-forward), or as an 'inclination' (a three-dimensional orientation where one of the dimensional components is more pronounced than the others) (Bartenieff & Lewis 1980, pp. 29-35; Preston-Dunlop 1984, p. ix).

3. A couple of other comments might be made to further clarify the concept of an 'inclination'. In rare cases pure diagonals and diameters are also referred to as 'inclinations' (Laban 1966, pp. 15-16), however in choreutic practice the term has become specialised to refer only to three-dimensional orientations with uneven dimensional components (Dell 1972, p. 11; Preston-Dunlop 1984, p. ix; Ullmann 1966, p. 145; 1971, p. 17). The term 'transversal' is sometimes used as synonymous with 'inclination' (Dell 1972, pp. 11-12; Ullmann 1966, p. 152; 1971, p. 17). Perhaps this equivalence grew from considering the cuboctahedral scaffolding in which all transverse lines are inclinations (Laban 1966, p. 68) (ie. no transverse dimensions as in an icosahedral scaffolding; see note 10). However, these two concepts are explicitly distinguished here since inclinations do not have to be transverse (eg. 'central inclinations' and 'peripheral inclinations' are also used) and a transversal does not have to be an inclination (eg. 'transversal dimension' within an icosahedral scaffolding) (Laban 1966, p. 108; Salter 1977, p. 134; Ullmann 1966, pp. 147, 165, 173, 184). 'Inclinations' could also be referred to collectively as 'deflections' since they are conceived to be an orientation which deflects between a pure dimension and a pure diagonal (Laban 1966, pp. 126-128; Ullmann 1966, p. 145). However, the notion of 'deflection' is kept distinct here to refer to the orientation <u>process</u>, while 'inclination' is used to refer to the orientation itself.

4. "*Aus Hauptrichtungen kombinierte Skalen in vier Schrägen über alle 24 Richtungen*" (Laban 1926, p. 52).

5. For an overview of the various patterns of choreutic scales (analogous to musical scales) see Preston-Dunlop (1984).

6 'Counter order' is the term used here to refer to the retrograde order as the one which Ullmann (1966) describes as the "natural order of succession" (p. 152) and conforming to the choreutic law of "compensation of extremes" (p. 149) whereby it feels "more comfortable, more pleasant . . . [and] the body feels it as a relief" (p. 148) to begin 'steep' (vertically stressed) inclinations from the (vertically stressed) frontal plane, to begin 'flat' (laterally stressed) inclinations from the (laterally stressed) horizontal plane, and to begin 'suspended' (sagittally stressed) inclinations from the (sagittally stressed) medial plane. That is, "the most natural way is produced when the movements compensate the extreme extension of the plane from which they start" (p. 174). Conversely, to perform transverse inclinations in the 'counter order' (Ullmann calls these 'inverted transversals' or 'inverted inclinations') the movement "is more demanding" (p. 148) since the movement "has, so to speak, to be taken by storm in order to overcome the resistance presented by the inverted inclinations" (p. 165). Notice that all the movements in the A-scales and B-scales (see Fig. 2) sequence through the planes in the order of frontal - medial - horizontal - frontal - etc. Counter order yields the reverse. It should also be noted that this "compensation of extremes"

makes sense only relative to an icosahedral-shaped 'scaffolding' (a map-like image of the kinesphere; see note 10) where each Cartesian plane is elongated along one of the dimensions (Ullmann 1966, pp. 139-143). If the planes are imaged as square, in a cubic (or cuboctahedral) scaffolding (as implied in modern-day Labanotation) there is not any dimensional stress, and so no extreme tension to be compensated.

7. "*Übermässige Dreiringe oder Doppelvoluten mit einer Ausschwungrichtung*" (Laban 1926, p. 72).

8. "*Kombinierte Skalen aus Hauptrichtungen mit Dimensionalen und Feigenschlüssen, die doppelt begangen werden*" (Laban 1926, p. 53).

9. "*Köperlich auszuführende Übung. Aus kurzen peripherischen Richtungen zusammen-gesetzte Skalen*" (Laban 1926, p. 47).

10. Laban (1966, 1984) used various polyhedra, especially the five 'regular solids', or 'platonic solids' (tetrahedron, octahedron, cube [hexahedron], icosahedron, dodecahedron) as well as other irregular polyhedra (eg. cuboctahedron, rhombic solids, stellated solids) as "kinespheric 'scaffolding'" (1966, p. 68). These serve as map-like networks or grids which can be used to plot-out sequences of movement pathways through space. When the body is imagined within the scaffolding its nodes or 'points' (polyhedral vertices) can be used like reference coordinates on a spherical map of the body's reach-space. When introducing the slight shift in 12 points between a cuboctahedral (cube + octahedron) as opposed to an icosahedral scaffolding, Laban notes that:

> The principles of choreutics can easily be developed by taking the cube as the basis of our spatial orientation. The conception of the cube as a basis is not a compromise but a fundamental principal of our orientation in space. In practice, harmonious movement of living beings is of a fluid and curving nature which can be more clearly symbolised by a scaffolding closer to a spheric shape [the icosahedron]. However, for general observation and notation of trace-forms, this variation is not vitally important. (Laban 1966, p. 101)

This slight shifting in the shape of scaffolding can be seen in current practice today where the same set of 'direction symbols' are used in choreutic scales relative to an icosahedral-shaped scaffolding while in Labanotation (implicitly through the use of 90° and 45° angles) they are used relative to a cuboctahedral scaffolding (note; this is a complex issue being only superficially identified here). The only factor to be highlighted in this paper is that the intricacies of the choreutic conception of spatial harmony, and the construction of choreutic 'scales' cannot be fully deciphered without understanding the difference in orientations relative to a cuboctahedral versus an icosahedral scaffolding. For example, shapes of the anatomical Cartesian planes will be rectangle in an icosahedron (lengthened along one of the dimensions) and the conception of the 'natural order' versus 'counter order' (see note 6) will only make sense with these planar shapes. The particular note here, relative to the discussion of vector symbols, is that the orientations of peripheral inclinations and transverse inclinations will only be parallel when they are conceived relative to an icosahedral scaffolding. Thus, it appears clear that Laban's symbols in *Choreographie* are designed according to icosahedral orientations.

11. The dimensional symbols listed as "trial-notation pure dimensions" ("*Schriftversuch Reine Dimensionen*") (Laban 1926, pp. 20-21) are slightly different than the dimensional symbols used in the notated movement sequences (Fig. 16). However this small difference does not seem significant but is just part of the workbook character of Choreographie.

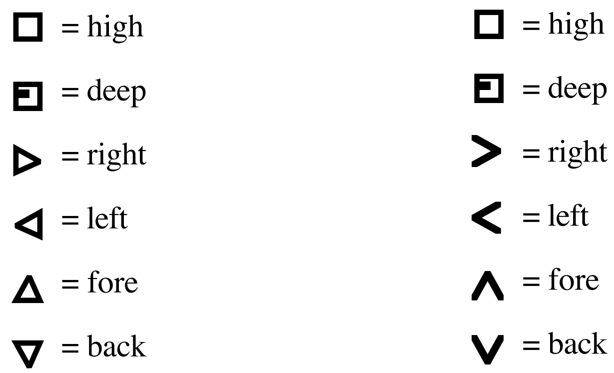


Figure 16. Two types of dimensional symbols experimented with in *Choreographie* (Laban 1926, pp. 20-21, 47).

12 Laban (1966) introduced "diameters" as "deflected from the dimensions or from the diagonals" (p. 11), and as "deflected directions" or "primary deflected inclinations" (pp. 15-16). This identifies diameters as deflections themselves, and so would be expected (according to deflection theory) to continue their deflecting process into a 3D inclination.

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