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Rudolf Laban's Dream: Re-envisioning and Re-scoring Ballet, Choreutics, and Simple Functional Movements with Vector Signs for Deflecting Diagonal Inclinations

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Rudolf Laban's Dream: Re-envisioning and Re-scoring Ballet, Choreutics, and Simple Functional Movements with Vector Signs for Deflecting Diagonal Inclinations

Abstract

Several methods of movement notation, forerunners of modern-day Labanotation/Kinetography were published by Rudolf Laban in his 1926 book Choreographie. One of these has been referred to as vector signs because they represent movement as orientations (slopes) of lines through space. This article begins by comparing Labanotation direction symbols with Laban's earlier vector signs by looking at differences when simple sequences are scored in both formats. Concepts of space within the vector signs are examined, particularly Laban's idea of deflecting inclinations where movements are categorized as mixtures of two fundamental contrasting spatial and dynamic tendencies: dimensional stability and diagonal mobility. This framework was embedded in several of Laban's notation methods, with the vector signs receiving the most use. Following Laban's method, these signs are applied to re-envision ballet movements, and this is augmented by using the center-of-mass of any limb or coordinative structure as the guide for movement pathways, an approach with ecological validity and promoting greater connectivity. The vector signs are further explored in free-style motifs of simple functional movements. Considerations are then given to how vector signs can be used to envision Laban's choreutics as deflecting diagonal motions, an alternative to the point-to-point method that is often used. Finally, Laban's persistent desire that movement is notated as motion (rather than positions) is highlighted, a wish remaining an old dream. An appendix is provided as a tutorial on reading vector signs, including several possible translations of each sign into Labanotation direction symbols.

Rudolf Laban's Vector Signs

"Everything Flows —The only constant is Change"—Heraclitus (535–475 BC)

In his early German book *Choreographie*,[1] Rudolf Laban explored a variety of notation signs for scoring dance movements. While these notations contributed to the development of Labanotation, most were abandoned and forgotten. In spite of this, some of the early notations have recently been revisited.[2] In particular, one group of 38 signs, the most frequently used in *Choreographie*, was translated into Labanotation where it was found that these signs were designed to notate lines of motion, without regard to any particular points or positions, an idea that Laban returned to years later, calling it "an old dream."[3] Given that Laban did not give these notations any particular name, they have been referred to as *vector signs*.[4]

Personal and public explorations of the vector signs[5] have revealed their potentials for revitalizing and invigorating the practice of choreutics (space harmony), and also for re-envisioning other areas of movement study, such as in the practice of dance technique and in the study of human functional movement.

Here, a review of vector signs is followed by kinegrams of ballet steps and short functional actions in an attempt to illustrate how vector signs might be used to re-envision the forms and dynamics of movement experience and performance.[6]

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1. Rudolf Laban, *Choreographie* (Jena, Germany: Eugen Diederichs, 1926).

2. Jeffrey Scott Longstaff, "Rudolf Laban's notation workbook, an historical survey of dance script methods from *Choreographie* (1926)" in *Proceedings of the twenty-fourth biennial conference of the International Council of Kinetography Laban* (2005).

3. Rudolf Laban, *Choreutics*. Annotated and Edited by Lisa Ullmann (London: MacDonald & Evans. 1966), 125.

4. Jeffrey Scott Longstaff, "Translating vector symbols from Laban's 1926 Choreographie" in *Proceedings of the twenty-second biennial conference of the International Council of Kinetography Laban*, (2001), 70–86; "A free space vector approach to Laban's choreutics," *Movement and Dance Magazine of the Laban Guild*, 20 (2, Summer)(2001): 10–11.

5. Jeffrey Scott Longstaff, "The Choreutic Organic Deflection Hypothesis" Paper and workshop at the third Motus Humanus Round table. Northfield, Minnesota: St. Olaf College (1997, June 5–8); "Vector Symbols as used in Choreographie" Paper workshop at the EUROLAB Conference, Rotterdam (1998, May 21–22); "Vectors and Deflections in Laban's Choreographie" in Theorising and Contextualising Dance, *Papers from the Laban Centre Research Day* (1999), 43–51; "Organisations of Chaos in an Infinitely Deflecting Body Space" Paper at A Conference on Liminality and Performance, Brunel University Twickenham, UK (2000, April 27–30); "Beyond the Scaffolding, Conceiving of a Choreutic Vector Space" Practical workshop, reviewed in, *Action Recording* 89 (2001): 2–4; "Prototypes and Deflections in Spatial Cognition and Rudolf Laban's Choreutics" in M. Kovarova and R. Miranda (Eds) *Proceeding of Conference Laban & Performing Arts* (2006), 87–104 (Academy of Music and Dramatic Arts, Bratislava Slovakia).

6. Readers, who wish, can jump forward to the Appendix: *Reading Vector Signs*.

General Comparisons of Vector Signs with Labanotation Direction Symbols

In *Choreographie*, an abundance of movement sequences are notated with vector signs. Some of these sequences are almost totally forgotten today, but others are still well known as they have been notated with direction symbols in textbooks for Laban Movement Analysis.[7] These sequences can be used to consider differences and similarities of scoring with vector signs as compared to direction symbols.

Axis Scales

In *Choreographie*, Laban uses vector signs to notate all four of the sequences that he calls *Achsenskalen* [Axis Scales].[8] These notations can be directly compared with the *same sequences* notated in direction symbols by recent authors.[9] Figure 1 shows the exact same four sequences, displayed side by side, once with vector signs, and once with direction symbols.
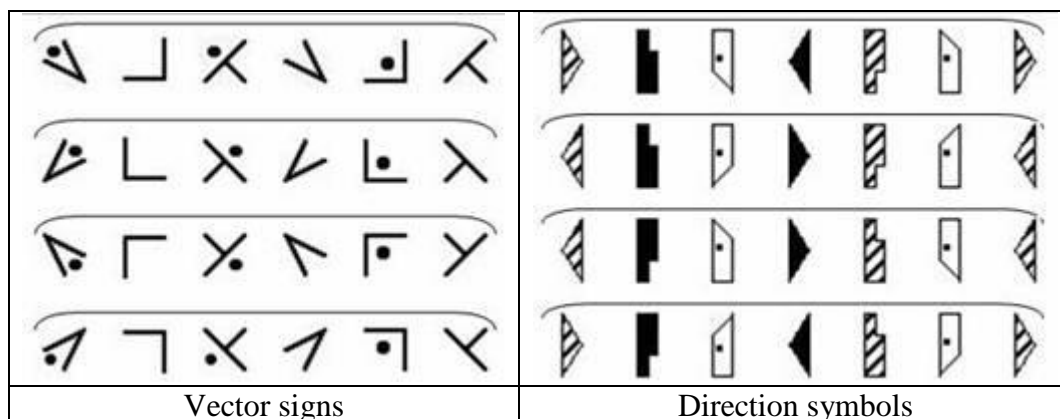

Vector signs	Direction symbols

Fig.1.The axis scales (notation read from left to right).

One obvious difference between the two scores is that vector signs use 6 signs for each sequence, while direction symbols require 7 signs. This is because each vector sign specifies a motion, while two direction symbols are needed for each motion. On the other hand, each direction symbol specifies a momentary location (position) during the sequence, while vector signs do not explicitly indicate any locations.

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7. For example Irmgard Bartenieff and D. Lewis, *Body Movement: Coping with the Environment* (New York: Gordon and Breach, 1980); Valerie Preston-Dunlop, *Point of Departure: The Dancer's Space* (Published by the Author, 64 Lock Chase, London SE3, 1984).
8. Laban, *Choreographie*, 43–44.
9. Bartenieff and Lewis, *Body Movement*, 44; Preston-Dunlop, *Point of Departure*, 39.

Equator Scales

As a kind of contrapuntal sequence to the four axis scales, Laban also notates four *Aquatorskalen* [Equator Scales].[10] These sequences are also well-known today, sometimes called girdles.
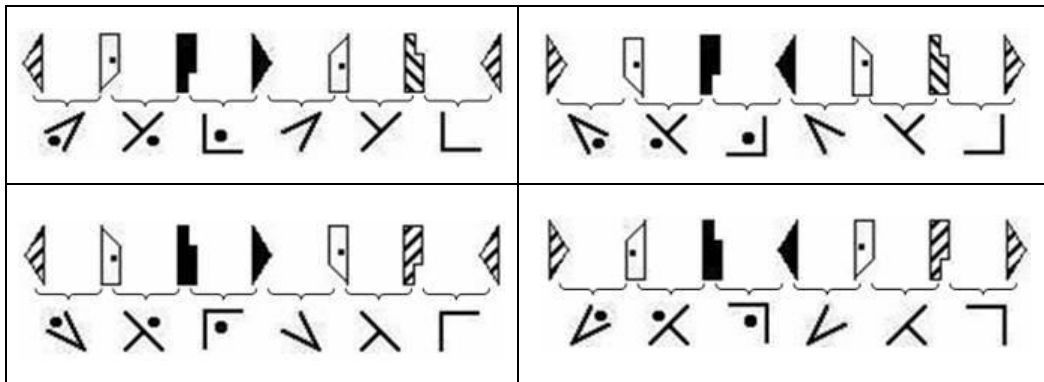

Fig. 2. Equator scales notated with direction symbols and vector signs.

Figures 1 and 2 together show that the same vector signs can be used for *transverse* movements (large motions cutting through space in the axis scales) and also *peripheral* movements (shorter motions around the edge of space in the equators). Table 1 gives some examples of how *the same vector sign* can indicate parallel *motions* of different sizes, and in different locations (see footnote 12).

Table 1. Examples of vector signs as both transverse and peripheral motions

Vector sign	Motion in an axis scale	Motion in an equator scale

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10. Laban, *Choreographie*, 46. (Laban notates the equator scales with *inclination numbers* instead of vector signs. Vector signs are used here since these were explicitly equated with the *inclination numbers* in several places, for example in the diagrams on p. 35 and the lists on pp. 44–45. Further, the vector signs were used for these same peripheral inclinations in other notated sequences, most explicitly on p. 47 in the "*Aus kurzen peripherischen Richtungen zusammengesetzte Skalen*" [scales assembled from short peripheral directions].)

Three-Rings

Another example demonstrating this characteristic of vector signs can be seen in sequences known as three-rings.[11] Like the axis and equator scales, the three-rings also come in large, transverse versions, as well as smaller peripheral versions. Figure 3 shows two pairs of examples—each pair with one transverse three-ring and one peripheral three-ring, notated with direction symbols and vector signs.
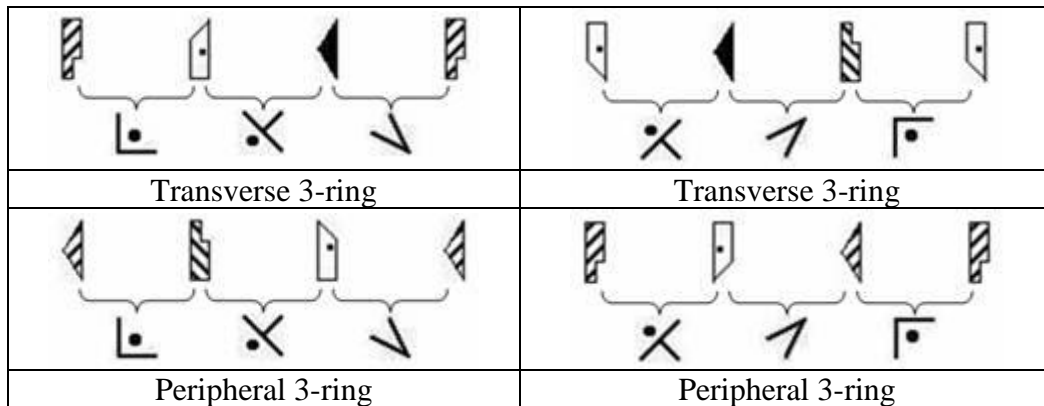
Transverse 3-ring	Transverse 3-ring
Peripheral 3-ring	Peripheral 3-ring

Fig. 3. Transverse 3-rings (top) and peripheral 3-rings (bottom).

As can be seen in Figure 3, the larger transverse 3-ring and the smaller peripheral 3-ring in each pair are notated with *different* direction symbols. However, each pair of 3-rings is notated with *identical* vector signs.

If the motions of each pair of 3-rings are closely compared, it will be found that the large transverse 3-ring and the smaller peripheral 3-ring are parallel.[12] That is, *theoretically*,[13] the 3 movement actions in each pair of rings, while occurring in different locations and in different sizes, nevertheless have the same identical orientations; they have exactly the same *slope*.

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11. Preston-Dunlop, *Point of Departure*, 37.

12. Parallelism between transverse motions and peripheral motions is dependent on an icosahedral-shaped spatial reference system (*scaffolding*) which contains different directional configurations than a cube. This is especially vital for sensing orientations of short peripheral motions. For example, in an icosahedron the horizontal plane is *wider* than the frontal plane, whereas in a cube, these planes have the same width. A peripheral motion from left-forward (horizontal plane) to left-high (frontal plane) in a cubic network progresses backwards & upwards, while in an icosahedron, it progresses backwards-upwards-rightwards (Figure 3).

13. The identical slopes of the two parallel three-rings is a theoretical, idealized abstraction, expressed in the notation of vector signs. However, in the real world every movement will be constantly deviating and deflecting as the body is required to twist and bend and accommodate through the prescribed pathways.

Inclinations: Deflecting Diagonals

Embedded in the orthography of the vector signs is Rudolf Laban's concept of *deflecting inclinations*. Understanding this principle in Laban's movement analysis is important for understanding how to read and write vector signs. The principle might be simply stated as:

> *Pure dimensional and pure diagonal movements do not occur,*
> *but will always deflect into irregular orientations*.

In the study and practice of Laban's choreutics (also known as *space harmony*), the concept of an *inclination* can be seen as specifically referring to a spatial direction that is *deflected* between a diagonal and a dimension.[14]

In some cases the concepts of an *inclination* and a *transversal* seem to be used in such a way that these appear to be synonymous[15] (probably because many inclinations move transversely between the periphery and the center of the movement space). However, to avoid confusion or misunderstanding, this synonymy should be avoided since inclinations are often *not* transverse (see peripheral 3-rings, Fig. 3). Any movement orientation (dimensions, diagonals, or inclinations) can be either *transverse* (cutting between the periphery and the center), *peripheral* (moving along the edge of the space), or *central* (moving directly towards or away from the center of the movement space).[16]

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14. Cecily Dell, *Space Harmony: Basic Terms* (New York: Dance Notation Bureau Press, 1972, Revised by Aileen Crow, 1969, Revised by Irmgard Bartenieff, 1977), 11.; Preston-Dunlop, *Point of Departure*, p.ix. ; Lisa Ullmann, "Rudiments of Space Movement," in *Choreutics*, by Rudolf Laban, annotated and edited by L Ullmann (London: MacDonald and Evans, 1966), 145. ; Lisa Ulmann, *Some Preparatory Stages for the Study of Space Harmony in Art of Movement* (Surrey, UK: Laban Art of Movement Guild, 1971), 17.

15. Dell, *Space Harmony*, 11–12.; Ullmann, "Rudiments of Space Movement," 152.; Ullmann, *Some Preparatory Stages*, 25.

16. Analyses of (1) *orientation* and (2) *relationship to center* (also known as "approach to kinesphere") should be explicitly differentiated. The idea of an *inclination* refers to an *orientation* of a spatial form, such as a line of motion. Generally, orientations are categorized as *one-dimensional*, *two-dimensional*, or *three-dimensional*. Within the category of three-dimensional orientations, the three dimensions (vertical, lateral, sagittal) might occur equally (a *pure diagonal*), or irregularly in unequal, amounts (an *inclination*). Related to this, but a different analytical component, is the relationship of a spatial form with the center of the movement space (the *kinesphere*). In Laban's analysis, spatial forms are categorized as having either a *central*, a *peripheral*, or a *transverse* relationship to center. Thus, a dimensional orientation could occur centrally, peripherally, or transversely. In the same way, an inclination could also occur centrally, peripherally, or transversely. For examples, see: Alan Salter, *The Curving Air* (London: Human Factors Associates, 1977), 134.; Ullmann, "Rudiments of Space Movement," 147, 165, 173, 184.

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Inclinations as Deflections between Pure Dimensions and Pure Diagonals

The principle of deflecting inclinations is implicit and embedded within Laban's early notation methods. This principle has been described by Laban and others in many places and in a variety of ways.

Irmgard Bartenieff observes that *pure* dimensional movements, pure diagonals, and also movements contained entirely within one of the three cardinal planes "rarely appear in pure form."[17] Instead, these usually occur as inclinations, described as *rough approximations of dimensions and diagonals*. In another place Bartenieff explains that "because the body limits the fulfillment of perfect three-dimensional shapes that pure diagonals would offer, most three-dimensional shapes are created through *modified* diagonals [i.e. inclinations] […] These *are* available to the body."[18]

In this case, the phrase *modified diagonals* refers to a movement that is near to a diagonal, perhaps striving to be a diagonal, but its orientation has slightly diverged toward one of the dimensions, creating an inclination. Thus, the diagonal could be described as being *modified*.

On the same topic, Lisa Ullman attests to her observations that "Such inclinations of the pathways of our gestures which have combined directional values are very frequent. In fact they are the rule rather than the exception."[19] Here, in a slightly different description, the idea of *combined directional values* is used to describe inclinations, in the sense that a dimensional direction is *combined* with a diagonal direction, creating a *combined* dimensional-diagonal deflection, referred to as an inclination.

Laban sets these modifications, combinations, and deflections of dimensions and diagonals as one of the core elements in his movement concepts, summarizing: "The two contrasting fundamentals on which all choreutic harmony is based are the dimensional tension and the diagonal tension."[20]

Inclinations as Mixtures of Stability and Mobility

This same principle of deflecting inclinations is also described in terms of stability and mobility (or lability). This highlights how the principal of deflections also functions in a similar way within Laban's approach to the energetic, qualitative dynamics of movement, known as *effort*.[21]

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17. Bartenieff and Lewis, *Body Movement*, 89–91.
18. Ibid, 33.
19. Ullmann, *Some Preparatory Stages*, 17.
20. Laban, *Choreutics*, 44.
21. Rudolf Laban and F. C. Lawrence, *Effort* (London: MacDonald and Evans, 1947).

Thus, *deflections* between *stability* and *mobility* appear in Laban's conception of *effort* (dynamics and qualities, also known as *Eukinetics*), which act as the counterpart to the parallel concept of *deflections* between *dimensions* and *diagonals* in Laban's conception of *space* (form and design, also known as *Choreutics*). This reinforces a *unified approach* towards understanding and deciphering human movement, with a core *principle of deflections*, i.e., having continuous variations and fluctuations operating throughout.

Laban summarizes the principle:

> 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 which are the more apt to reflect trace-forms of living matter.[22]

Lisa Ullmann reiterates:

> […] the 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.[23]

Notations for Inclinations (Dimensional/Diagonal Deflections)

Laban developed and experimented with a variety of *scripts* (methods for notating movement) from his early days in Germany, and continuing through to his later years in England, which incorporated this principle of deflecting inclinations within the essential graphic or alphabetic design of the notation system. Using the deflection principle meant that each notation sign, or verbal code, must include indications of *both* a diagonal element and also a dimensional element. With both a dimension and a diagonal indicated, the direction emerges through the deflection (interaction) between these two elements.

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22. Laban, *Choreutics*, 90. (Note how the word "or" in this statement: "deflected *or* mixed inclinations" is used in the sense of "or also called," i.e., two names for the same thing).

23. Ullmann, "Rudiments of Space Movement," 145.

Laban described his considerations about how to develop such a script, choosing between two options that are essentially equivalent:

> One can regard the […] inclinations as a relationship between purely dimensional and purely diagonal spatial-situations. From this there appear two possibilities: To put forward either a diagonal deflected through a close-by dimensional, or alternatively, a dimensional deflected through one of the closest diagonals. Since to us the dimensional-concepts are more familiar, we shall relate the positional-inclinations to these.[24]

Thus, taking the pure diagonals (four diagonals, each with two directions, totaling *eight pure diagonal directions*), and deflecting these by each of the *three dimensions*, a total of *24 inclinations* (deflected diagonals) can be derived. Laban begins by listing all of these by name (Table 2).[25]

Table 2. Twenty-four inclinations—*names* of dimensional-diagonal-deflections

Flat (lateral)	Steep (vertical)	Suspended (sagittal)
right-high-fore	**high**-fore-right	**fore**-right-high
left-high-fore	**high**-fore-left	**fore**-left-high
right-high-back	**high**-back-right	**back**-right-high
left-high-back	**high**-back-left	**back**-left-high
right-deep-fore	**deep**-fore-right	**fore**-right-deep
left-deep-fore	**deep**-fore-left	**fore**-left-deep
right-deep-back	**deep**-back-right	**back**-right-deep
left-deep-back	**deep**-back-left	**back**-left-deep

Inclinations are listed according to the *primary* (largest) dimension, and referred to as *flat* (*lateral* deflections), *steep* (*vertical* deflections) or *suspended* (*sagittal* deflections).[26] In addition, each inclination will have a *secondary* and a *tertiary* dimensional component, represented by the order of the words in each name. For example, the inclination *deep-back-left* has a slope that is primarily *downwards*, somewhat *backwards*, and just a little bit *leftwards*.

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24. Laban, *Choreographie*, 13. (*Neigung*, translated as "inclinations")

25. Ibid. (Laban lists the names of all twenty-four inclinations in a continuous paragraph, with each 3-part name separated by a comma. Here, Laban's paragraph is arranged in a table for easier viewing. The order of the dimensional words indicates their magnitude in that inclination)

26. Ibid, 75. (*flachen* [flat], *steile* [steep], *schwebend* [suspended]); Bartenieff and Lewis, *Body Movement*, 40.

The same scheme as in Table 2 is used in several other proposed notations. In the "preliminary definition of abbreviations,"[27] names for each dimension are shortened to one letter, leaving three letters to indicate each inclination (Table 3).

Table 3. Twenty-four inclinations—abbreviated names

Flat (lateral)	Steep (vertical)	Suspended (sagittal)
R h f	**H** f r	**F** r h
L h f	**H** f l	**F** l h
R h b	**H** b r	**B** r h
L h b	**H** b l	**B** l h
R d f	**D** f r	**F** r d
L d f	**D** f l	**F** l d
R d b	**D** b r	**B** r d
L d b	**D** b l	**B** l d

Laban kept experimenting with this same group of 24 inclinations. Another example is shown in Table 4 where he used a directional *pin* to indicate deflecting diagonals, together with black dots to signify downwards motion, and little arrows indicating lateral and sagittal deflections.[28]

Table 4. Twenty-four inclinations—diagonal pins

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27. Laban, *Choreographie*, 15 (primary dimensions have been capitalized for emphasis).
28. Ibid, 32.

Many ears later in England, after Labanotation/Kinetography had been formally established (*without* any signs for inclinations), Laban continued to advocate *movement* analysis based on deflecting diagonals (inclinations). This time the eight direction symbols for pure diagonals were used, combined with letters[29] indicating dimensional deflections of the diagonals. He promoted these in the final chapter of what was intended to be the first book written to introduce his work in England. Here, the use of inclinations was encouraged, now represented as "simplified symbols" for "free inclinations" or "free space lines" (Table 5).[30]

Table 5. Twenty-four Inclinations—"simplified symbols" for "free inclinations"

Flat (lateral)	Steep (vertical)	Suspended (sagittal)
r	h	f
l	h	f
r	h	b
l	h	b
r	d	f
l	d	f
r	d	b
l	d	b

Laban describes how these 24 symbols represent "an *infinite* number of parallel inclinations, including those of the transversals and the [peripheral] surface lines of the scaffolding [which] do not go through the centre."[31] Additionally, he reinforced his view of the importance of this conception of infinite inclinations with an imperative, asserting that "The future development of kinetography *must* include the possibility of recording forms in free space."[32]

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29. Letter abbreviations: f = forward, b = back, r = right, l = left, h = high, d = deep.
30. Laban, *Choreutics*, 125–130.
31. Ibid, 128. [italics, mine]
32. Ibid, 125. [italics, mine]

Of all these methods for writing inclinations, it is the vector signs from *Choreographie* that have been used in the greatest number of notated sequences.[33] The entire group of 38 vector signs are arranged in Table 6. These include 24 vector signs for *deflecting* diagonals (inclinations), 8 corresponding vector signs for *pure* diagonals, and 6 vector signs for pure dimensions.

Comparing the shapes of the signs can provide an idea about how they can be read and understood as a complete group. For example, all of the signs related to the same diagonal are similarly oriented.

Table 6. Vector signs—inclinations, diagonals, dimensions

Inclinations (deflecting diagonals)			Pure Diagonals
Flat (lateral)	*Steep* (vertical)	*Suspended* (sagittal)	
right-high-fore,	**high**-fore-right	**fore**-right-high	
left-high-fore	**high**-fore-left,	**fore**-left-high	
right-high-back	**high**-back-right	**back**-right-high	
left-high-back	**high**-back-left	**back**-left-high	
right-deep-fore	**deep**-fore-right	**fore**-right-deep	
left-deep-fore	**deep**-fore-left	**fore**-left-deep	
right-deep-back	**deep**-back-right	**back**-right-deep	
left-deep-back	**deep**-back-left	**back**-left-deep	
Left Right	Up Down	Fore Back	
Pure dimensions			

Additional detailed and practical understanding of how to read and write these vector signs can be found in the many examples given below in the Appendix: *Reading Vector Signs.*

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33. Laban, *Choreographie*, 35, 44, 45, 47, 50, 51, 52, 53, 66, 71.

Re-scoring Ballet as Deflecting Inclinations

Laban's Outline of Inclinations in Ballet

A large part of Laban's approach in *Choreographie* involves reinterpreting ballet, analyzed in more than seven chapters, and culminating with a list of five points comparing ballet with the "new dance-script."[34] The directional aspects of the five ballet positions (indicated with Roman numerals: I, II, III, IV, V) are equated with particular vector signs and presented in two diagrams, one for downward motions (Figure 4), and one for upward motions (Figure 5).[35, 36]
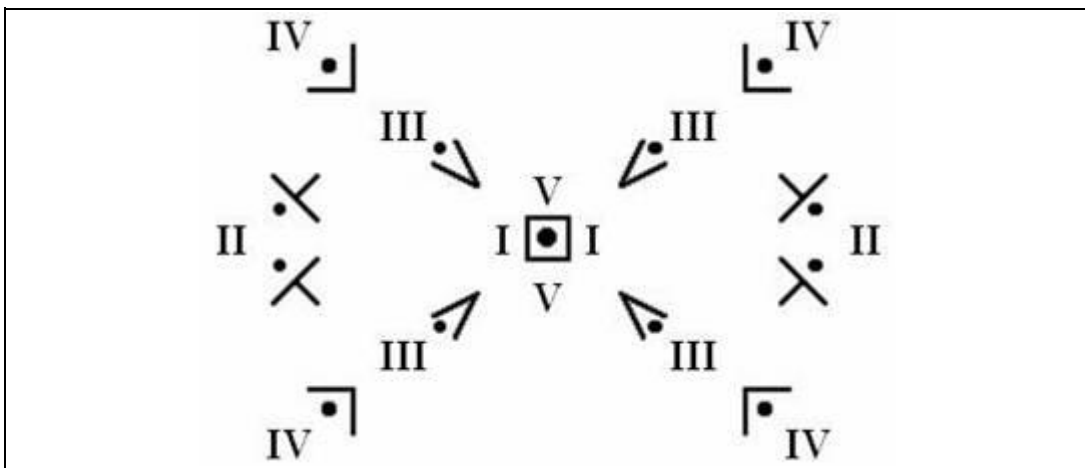
Fig. 4. The five ballet positions as *downward* inclinations (motions).

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34. Laban, *Choreographie*, 64.

35. Ibid., 35.

36. Figures 4 and 5 have been modified slightly. Both figures included four different vector signs for inclinations leading to the 3rd position, and also four vector signs leading to the 4th position. This is because, for example, a step with the right foot into 3rd position, could step into 3rd position *front*, or 3rd position *back*, and a step with the left foot also has two choices (*front* or *back*), resulting in *four* different possible vectors for stepping into the 3rd position (and *four* different vectors for stepping into the 4th position). However, when stepping with the right foot into 2nd position, there is only one choice, *to the side*. Thus, for the 2nd position, Laban only wrote *two* vector signs. This difference between the 3rd and 4th ballet positions, versus the 2nd position occurs because the ballet positions are *locations*, whereas the vectors are *motions*. When this is considered, it can be seen that *movements* into 2nd position also have four different options (equivalent to the 3rd and 4th positions). For example, if the right foot is stepping into 2nd position it might begin in 4th position back, hence the *movement* would include forwardness. Thus the number of vectors corresponding to each position (2nd, 3rd, and 4th) is the same. Accordingly, in the figure here, all four vectors have been included for each position. This also agrees with Laban's list of "inclination numbers" which were included in the figure, but are not listed here. (Note that the 1st and 5th positions were ignored since they are considered to be one-dimensional.)

Figures 4 and 5 might be interpreted as equating vector signs with ballet *positions*. However it is clear in the "explanation of the signs" (Table 7) that vectors represent *motions* that are "*leading to*" particular ballet positions.[37]
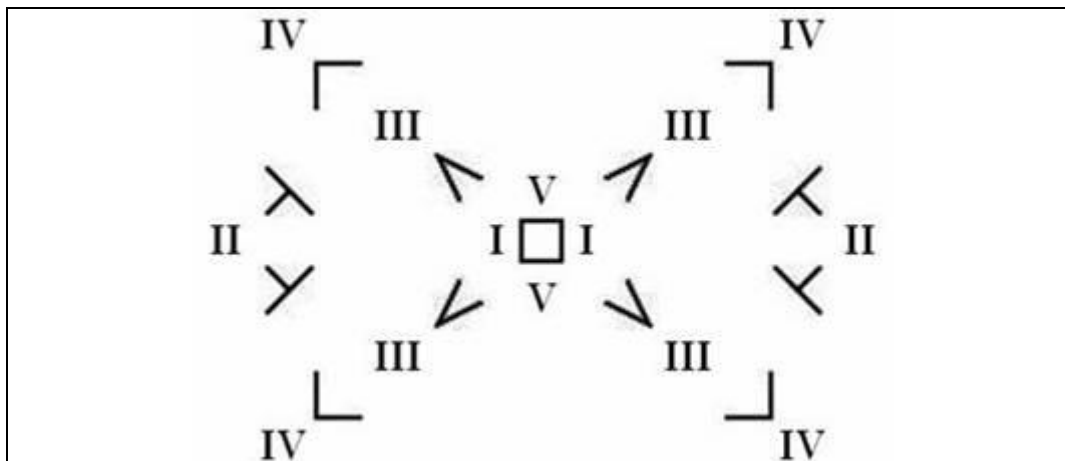
Fig. 5. The five ballet positions as *upward* inclinations (motions).

Table 7. "Explanation of the signs"

The flat inclinations	*leading to*	2nd [position] left		2nd [position] right	
	" "	2nd [position] left		2nd [position] right	
The steep inclinations	*leading to*	3rd [position] left-forward		3rd [position] right-forward	
	" "	3rd [position] left-backward		3rd [position] right-backward	
The suspended inclinations	*leading to*	4th [position] left-forward		4th [position] right-forward	
	" "	4th [position] left-backward		4th [position] right-backward	

The 1st and 5th positions are not included as inclinations, because they are considered to be "purely in one dimension" as "representatives of the vertical."[38]

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37. Laban, *Choreographie*, 44. (Table 7 has been re-arranged to fit the page.)
38. Ibid, 14, 19.

Laban rephrases this same equation between ballet and deflected diagonals (inclinations) in many places, for example:

> […] directions of the third position reveal themselves […] as narrow *steep* diagonals […] the fourth position as wide, *suspended* diagonals […] [and the] purely lateral direction (second position) reveals itself in this way as a diagonal, and in fact it comes once *flat* from in front, and once *flat* from behind. Hence we name the two deflected directions resulting from second position as the *flat* ones, distinguishing these from those of third position (*steep*) and fourth position (*suspended*).[39]

This scheme outlined in Table 7 can serve as a basis for re-envisioning ballet according to deflecting diagonal inclinations. In any ballet *movement*, when the positions are identified (especially the 2nd, 3rd and 4th positions) it can be possible to re-score the movements according to deflecting diagonal inclinations.

Bodily Locus of Control in Deflecting Inclinations

When exploring deflecting diagonal motions from one ballet position to another, a question arises about which part of the body should be guided along the path of the inclination. In Labanotation, gestures are indicated and controlled by guiding the movement of the *free end of a limb* relative to the point of attachment of that limb (or a body area). Thus the free end of the limb is guided through space until the limb achieves a position with the desired limb-orientation.

However, movement along inclinations is about the orientation of a line of motion, regardless of the orientation of the limb. A comparable notation is used in Laban motif writing, called "direction of the progression,"[40] where a line of motion is specified. However, the direction of progression method does not easily represent the irregular orientations of inclinations.

Personal, informal, explorations with inclinations have found that using a specific body part (a fixed anatomical location) to guide motions tends to restrict possibilities for limb configurations that might, otherwise, tend to spontaneously occur. For example when an inclination is embodied by a particular limb (or multiple limbs or a body area), embodying the slope of that inclination might be best afforded (organically—according to the logic of anatomy) by a series of joint articulations within the limb or body area during the course of the motion.

However, if one single particular anatomical location is selected as the

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39. Laban, *Choreographie*, 19. (italics, mine)
40. Ann Hutchinson Guest, *Your Move: A New Approach to the Study of Movement and Dance*. (New York: Gordon and Breach, 1983), 261.

solitary point of control (as when moving *the free end of a limb* into a new limb orientation) this can restrict the coordinated articulations that might otherwise be spontaneously facilitated to occur within the limb or body area during the course of the motion.

By practical experiment it was perceived that guiding movements with the *center-of-mass of a limb* can encourage sequences of articulations within the limb (or body area) to be spontaneously discovered through the logic of anatomical constraints and affordances.

Using the center-of-mass as the locus of control for body movement may be a valid approach in the context of motor control and body organization. The main justification for this is that body parts in motion are *not* typically controlled individually, but are linked together in functional units which are described in many ways, for example as "kinematic chains,"[41] "kinetic muscular chains,"[42] or "functional synergies."[43] Also called "coordinative structures,"[44] they often span across two or more joints and are integrated to function as a single system.

Depending on the bodily configuration within a coordinative structure, the center-of-mass (a theoretical concept—*not* a fixed place) can move *within* the mass of the body, or it may be located completely *outside* of the physical body in the nearby space. Thus, the location of the center-of-mass will change, depending on the configuration of the body segments.

Drawing a line in the air with *one* body part (the distal *free end* of a limb) can lead to isolated or disconnected motion, as if one part of the body is following a movement, while the remainder of the body does very little. In contrast to this, guiding a movement with the center-of-mass of an entire coordinative structure tends to produce more full-body involvement with varieties of articulation patterns which accommodate to the movement progression.

Further, controlling centers-of-mass will be a basic part of neural-motor language according to the "mass-spring model" of motor control[45] where body movements are controlled in a system of masses and springs, the *masses* (weight) being the physical substance of the body, and the *springs* being the spring-like characteristic of muscles. Movement is initiated (and controlled) by adjusting the spring-like tension between opposing agonist and antagonist muscle groups.

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41. Nikolai Bernstein, "The Problem of the Interrelation of Co-ordination and Localization (1935)." In Human Motor Actions: Bernstein Reassessed ed. H. T. A. Whiting (New York: North Holland, 1984), 82.
42. Bartenieff and Lewis, *Body Movement*, 21, 103.
43. Martin R. Sheridan, "Planning and Controlling Simple Movements." In *The Psychology of Human Movement*, ed. M. M. Smyth and A. M. Wing (London: Academic Press, 1984), 49.
44. T. A. Easton, "The normal use of reflexes," *American Scientist* 60, (1972): 591–599.
45. Sheridan, "Planning and Controlling Simple Movements," 69–73.

When-tension is increased on one side of agonistic-antagonistic muscle groups, the body will move till muscles reach the *equilibrium point* where tension between muscle groups is equal. New motions are initiated by re-adjusting opposing muscle-spring tensions, hence, establishing a new equilibrium point.

Within this model, the essential information needed by the motor system is 1) how much mass (weight) is in the limb(s) or body area to be moved, and 2) the horizontal distance of the center-of-mass from the articulating joint(s). These two factors determine how much tension needs to be activated in opposing muscle groups across a coordinative structure (possibly spanning several joints).

Thus, using the *center-of-mass* of a coordinative structure (kinetic chain) as the locus of control will have ecological validity since it reflects the language of the motor system. This mode of control can be more apt to encourage spontaneous coordination (*connectivity*) throughout the entire body.
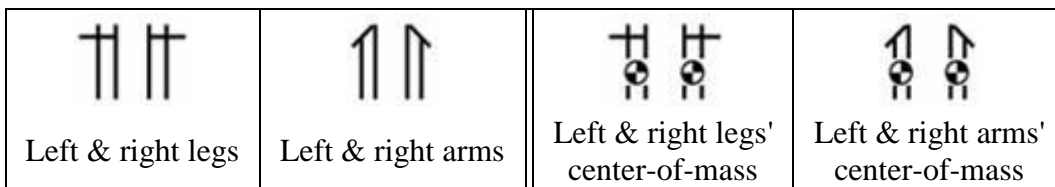
Left & right legs	Left & right arms	Left & right legs' center-of-mass	Left & right arms' center-of-mass

Fig. 6. Labanotation body signs, modified with symbol for center-of-mass.

Notation Signs for the Center-of-mass of a Leg or an Arm

For notation, the Labanotation signs for arms and legs were adapted by adding the physics symbol for center-of-mass[46] (see Fig. 6). These signs for the center-of-mass of a limb do *not* indicate one particular anatomical spot. The location of the center-of-mass of a limb will depend on the configuration of parts within the limb. If the leg or arm is entirely straight, then its center-of-mass will be more distal, but as a limb flexes or curls, its center-of-mass will become more proximal, and can be located in the space completely outside of the physical limb.

Humans can sense the center-of-mass of their limbs, or their whole body, and use this awareness in many skills. In the track and field high jump, skilled jumpers will perform a "Fosbury Flop", curving their body such that the center-of-mass passes *under* the high-bar while the physical body passes *over* the bar. Skilled dancers use the "floating illusion"[47] where, at the height of a jump, a dancer begins to lower the arms and legs, thus allowing the center-of-mass to descend while the head and shoulders can momentarily remain at the same height.

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46. Andy Ruina and Rudra Pratap, *Introduction to Statics and Dynamics* (Oxford University Press, 2015), 138.

47. Kenneth Laws, *The Physics of Dance* (New York: Shirmer: 1984).

Examples of Ballet Actions and Phrases
Re-envisioned and Re-scored as Deflecting Inclinations

A few simple ballet actions are presented, followed by some short ballet phrases. Each is presented with two different scores plus a verbal description. One score uses simple Labanotation on a staff, and the other score uses an adaptable motif format with vector signs and centers-of-mass of bodily limbs.

Shifting from 3rd Position into 2nd Position of the Feet

Figure 7 shows how an action of shifting the weight from 3rd position into 2nd position can follow a flat inclination (laterally deflecting diagonal). Notice how the right leg, which starts 3rd position behind, will move mostly sideways, but also slightly forward, to arrive at 2nd position, directly to the side.

1) The right leg begins in 3rd position back.
2) Next, the right leg moves on a *laterally deflecting diagonal* (flat inclination), mostly rightwards, somewhat downwards, and slightly forwards.
3) Finally, the legs arrive in the 2nd position.

Fig. 7. Shifting from 3rd position into 2nd position.

Even without bending the legs (*plié*) there will still be a downwards component of the flat inclination of the right leg because the center-of-mass of the whole body will lower slightly when a wide 2nd-position stance is taken. Using the *plié* just exaggerates this effect and encourages the sensation of the motion along that deflecting diagonal—a flat inclination.

In ballet practice, moving from 3rd to 2nd position might be conceived as a pure sideways movement, with no forwards or backwards, and the dancer may endeavor to portray this impression. However, in this vector approach, and Laban's *new choreography* expressing mobility and three-dimensionality, the underlying motion of the center-of-mass is expressed in the deflecting diagonal.

Raising the Leg to *Passé*

Figure 8 shows how the ballet action of raising the leg to *passé* leads into a steep inclination of the center-of-mass of the leg. In ballet this might be visualized as a purely upwards motion, though the sideways motion of the knee takes the leg's center-of-mass to the side, and also, for most people, the knee, and thus the

center-of-mass, will also deviate slightly forward. Additional forward motion of the center-of-mass occurs when the right leg is raised off the floor and the entire body weight is shifted forward onto the left leg (front leg). Together, as shown in Figure 8, these factors tend to produce a steep inclination of the center-of-mass of the gesturing leg while it moves from the ballet 3rd position into *passé*.
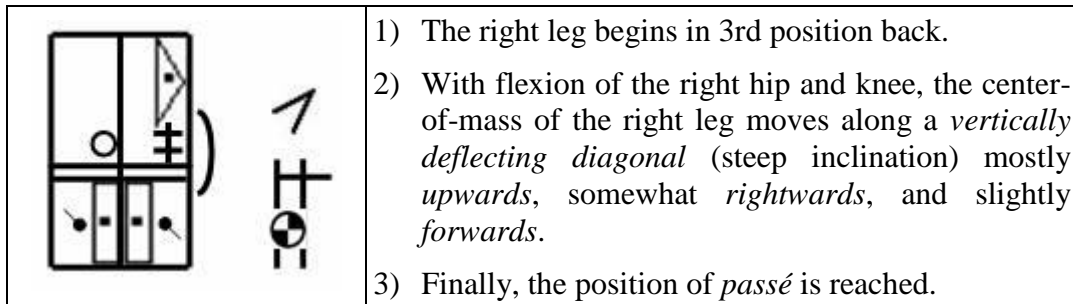
	1) The right leg begins in 3rd position back. 2) With flexion of the right hip and knee, the center-of-mass of the right leg moves along a *vertically deflecting diagonal* (steep inclination) mostly *upwards*, somewhat *rightwards*, and slightly *forwards*. 3) Finally, the position of *passé* is reached.

Fig. 8. Raising the right leg to *passé*.

Shifting from 3rd Position into 4th Position of the Feet

Figure 9 shows a weight shift with the right leg moving from the 3rd position to the 4th position. In ballet, the slight rightwards motion might be minimized, especially if the 4th position is intended to be directly in front of 5th position. However, to promote the spontaneous deflections which may tend to occur through anatomical constraints and momentum, a small degree of sideways motion is assumed in this vector. This is also how Laban envisioned the *new choreography*, as shown in his diagram of ballet positions and vector signs where he uses a *wide 4th position* (see Fig. 4, above).

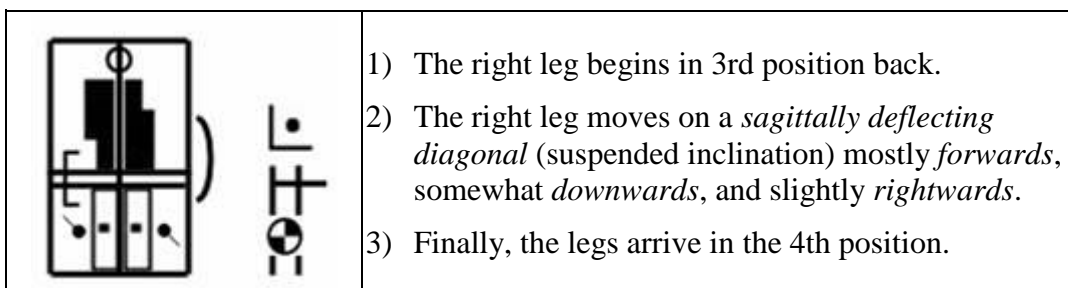|	
	1) The right leg begins in 3rd position back. 2) The right leg moves on a *sagittally deflecting diagonal* (suspended inclination) mostly *forwards*, somewhat *downwards*, and slightly *rightwards*. 3) Finally, the legs arrive in the 4th position.

Fig. 9. Shifting from 3rd position into 4th position.

Even without bending the legs (*plié*) there would still be a downwards component because the center-of-mass of the whole body will lower slightly when a full 4th position stance is taken. Using the *plié* exaggerates this effect and encourages the sensation of the motion along that deflecting diagonal.

Pas de Bourrée Variation 1: The Lateral Dimension

The short phrases of two vectors in this *pas de bourrée* variation (Figures 10 & 11) show how the stepping pattern creates a type of curving path that Laban described as a *volute*, in this case with the lateral dimension continuing through both vectors and integrating the 2-phase motion with "continuity of form."[48]

Figure 11 also details how two steps along the same diagonal allow momentum to be carried into the start of the next *pas de bourrée*.
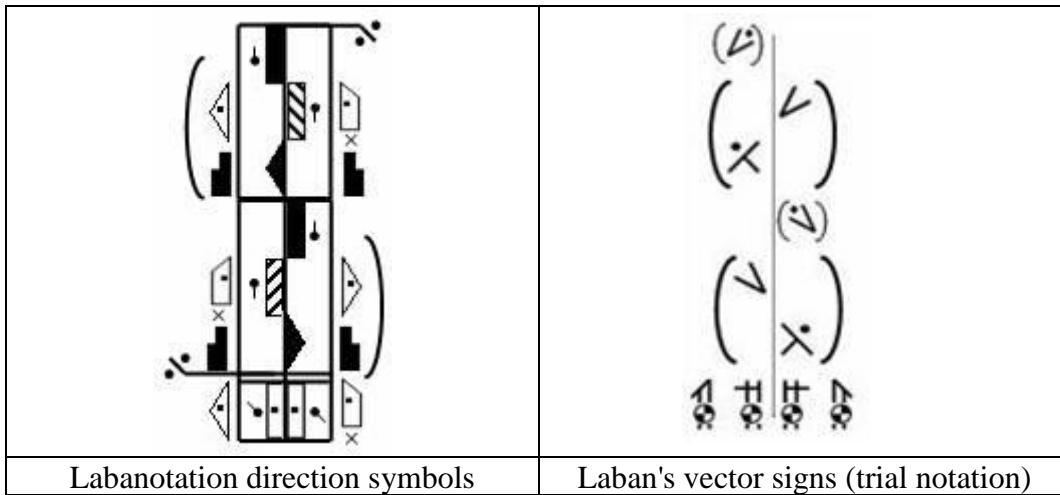

| Labanotation direction symbols | Laban's vector signs (trial notation) |

Fig. 10. *Pas de bourrée* variation #1.

2) *Steep* deflection of:
   diagonal—backwards-up-*left*
1) *Flat* deflection of:
   diagonal—forwards-down-*left*

Second volute, moving *leftwards*:

2) *Steep* deflection of:
   diagonal—backwards-up-*right*
1) *Flat* deflection of:
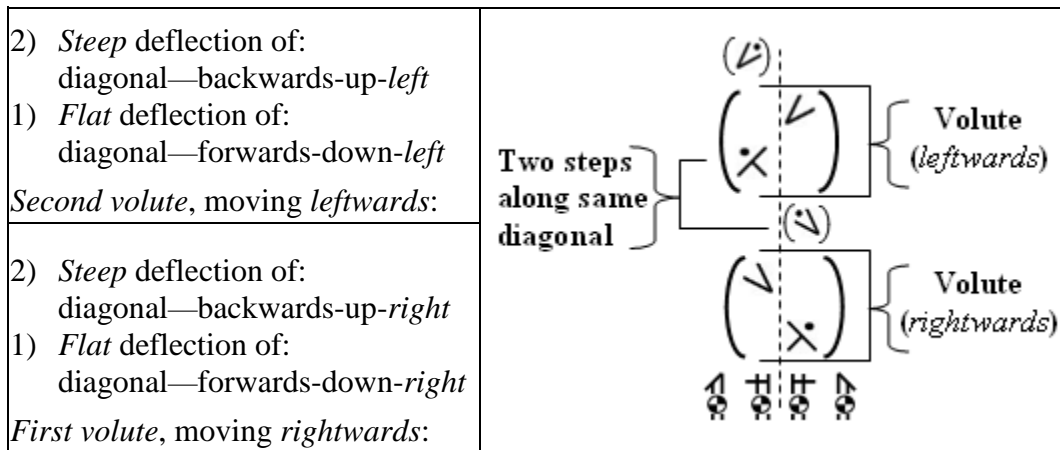   diagonal—forwards-down-*right*

First volute, moving *rightwards*:

Fig. 11. *Pas de bourrée* variation #1—analysis of vectors (stepping pattern).

48. Dell, *Space Harmony*, 17. (Other *kinds of volute* with less three-dimensionality were also identified in vector patterns of ballet sequences, and signified as *2d* or *1d*: see Table 8 below).

Pas de Bourrée Variation 2: The Lateral Dimension

Both *pas de bourrée* variations (Figures 10 and 12) use exactly the same stepping pattern, but the arms in the second variation deflect with greater dynamics.
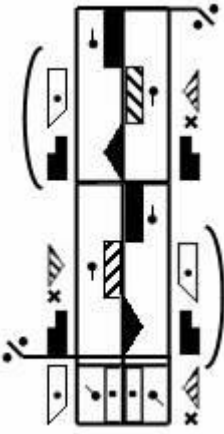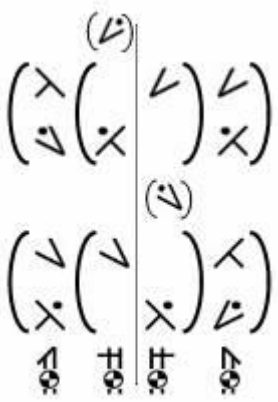

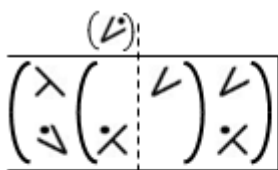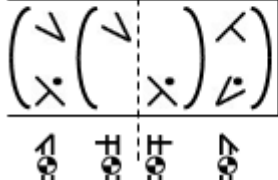| Labanotation direction symbols | Laban's vector signs (trial notation) |

Fig. 12. *Pas de bourrée* variation #2.

- Two arms:
  same diagonals, different deflections.
- *Right arm* and stepping pattern:
  same diagonals, same deflections

All three volutes are moving *leftwards*.

- Two arms:
  same diagonals, different deflections.
- *Left arm* and Stepping pattern:
  same diagonals, same deflections

All three volutes are moving *rightwards*.

Fig. 13. *Pas de bourrée* variation #2—analysis of vectors.

Figure 13 highlights two groups of volutes. In the first group (bottom), all of the vector signs include *rightward* motion, and all the volutes move primarily rightwards. Likewise, in the 2nd group (top), all of the vector signs include *leftward* motion, with all of the volutes moving primarily leftwards. Further, in both groups, one arm has exactly the same vectors as the stepping pattern, while the other arm has vectors along the same diagonals, but with different deflections.

Chassé **Variation: The Sagittal Dimension**

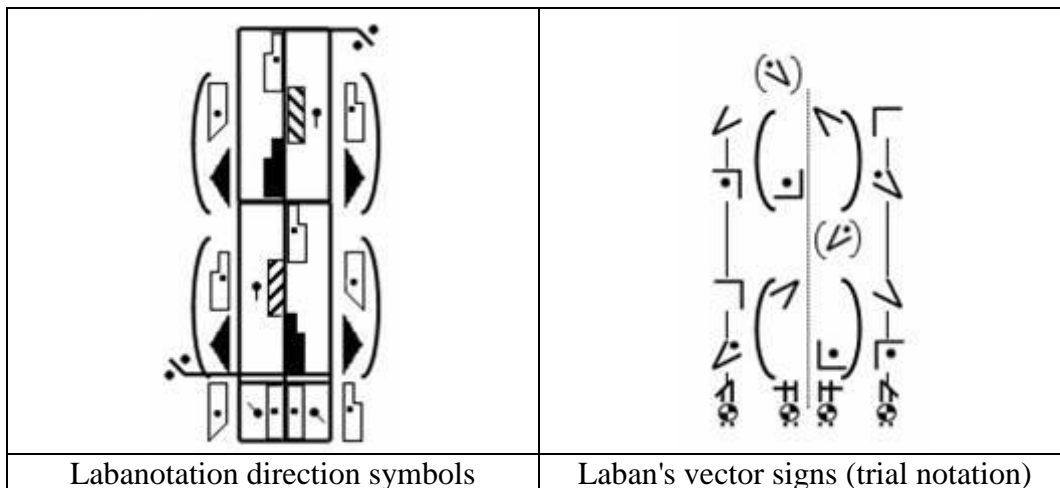| Labanotation direction symbols | Laban's vector signs (trial notation) |

Fig. 14. *Chassé* variation (alternating sides).

Figure 14 shows a *chassé* variation and Figure 15 specifies details of the vectors in the arm gestures and in the whole body stepping pattern. Both of these create a *kind of volute* where the 2-phase motion consists of deflections from two different diagonals (two vector signs) with two of the dimensional components carrying through the entire (2d) volute. The *chassé* is initiated with a downward *suspended* vector (gaining forward speed), followed by an upward *steep* vector (possibly into the air). The forward moving arm uses the same diagonals as the stepping pattern, but with different deflections.
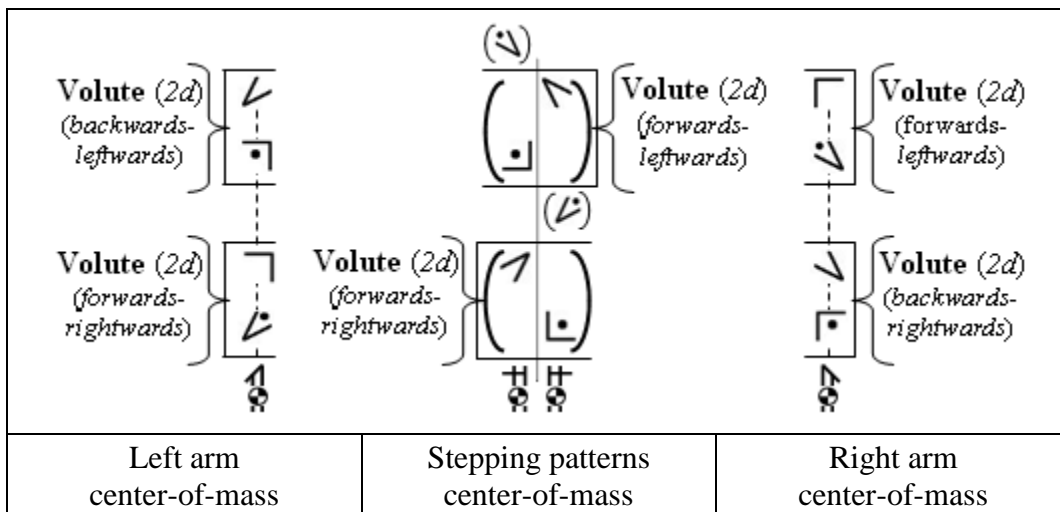

| Left arm center-of-mass | Stepping patterns center-of-mass | Right arm center-of-mass |

Fig. 15. *Chassé* variation (alternating sides)—analysis of vectors.

Passé Relevé **Variation: The Vertical Dimension**

Figure 16 shows a variation of a ballet *passé relevé*, emphasizing movement in the vertical dimension. This sequence is built on the steep inclination (vertical deflection) within the action of raising the leg to *passé* (see Fig. 8).

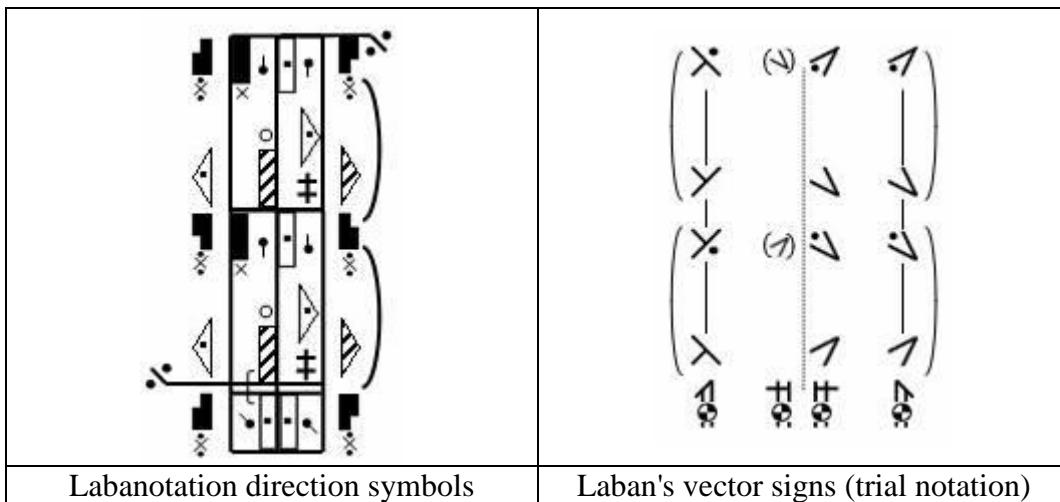| Labanotation direction symbols | Laban's vector signs (trial notation) |

Fig. 16. *Passé relevé* variation; the vertical dimension.

Figure 17 highlights how a *kind of volute* occurs in each phrase, here referred to as (1d) *flat volutes* or *steep volutes*. The flat volutes can provide some stability by spreading into the horizontal plane, and can lead this sequence to deflect into turning. The steep volutes bring dynamics of weight in the vertical dimension and can lead the sequence to deflect upwards, hopping off of the floor.
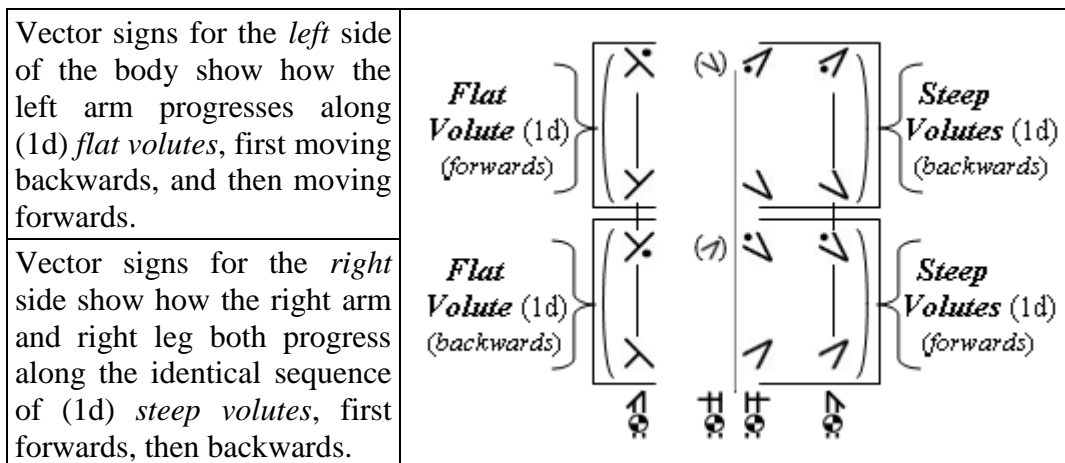

| Vector signs for the *left* side of the body show how the left arm progresses along (1d) *flat volutes*, first moving backwards, and then moving forwards. | |
| Vector signs for the *right* side show how the right arm and right leg both progress along the identical sequence of (1d) *steep volutes*, first forwards, then backwards. | |

Fig. 17. *Passé relevé* variation—analysis of vectors.

Kinds of Volute in the Translation of Ballet into Vector Signs

In the process of re-envisioning ballet sequences as deflecting inclinations, it was noticed that many of the phrases included a type 2-phase movement that Laban called a *volute*. Some of the volutes observed corresponded to those described by Laban though others were slightly different—this difference being indicated here by referring to each of these variations as a *kind of volute*.

Specifying different kinds of volute is a *very minor point* to this article. They are mentioned here as a theoretical note that some of these are slightly different than Laban's traditional definition. Table 8 distinguishes the three types of volute considered above. All of the volutes contain a phrase of *two inclinations* (two deflecting diagonals) but they differ according to their dimensional aspects.

Table 8. Deciphering kinds of volute

Volutes: (Laban's *core definition*): A phrase of 2 *different* diagonals, each deflected by a dimension.	*Pas de Bourrée* Variations	*Chassé* Variation	*Passé Relevé* Variation
	Laban's volute	(*2d Volute*)	(*1d Volute*)
Deflecting dimensions - each diagonal is deflected by:	a different dimension	a different dimension	the same dimension
Continuous dimensions - running through the entire volute:	one	two	one

Laban's volute has the most three-dimensionality. The other two kinds of volute have been referred to here as *2d* and *1d*. This nomenclature may not be satisfactory, but at present is hopefully sufficient.

Re-envisioning Ballet as Deflecting Inclinations: Limits and Benefits

This exploration into re-scoring ballet as deflecting inclinations is *not* intended as a proposal that ballet scores should be notated with vector signs. For dance preservation, using the vector signs would probably be inappropriate as they do not specify exact locations of limb gestures and body positions.

Instead, the potential value of the vector signs, and their representation of deflecting diagonal inclinations, may be in the promotion of mental, visual and kinesthetic concepts and images of *motion*, as a contrast to common graphic representations and mental-verbal concepts of movement as a series of poses or positions. Using vector signs as supplemental motifs encourages the possibility of seeing and visualizing *motions* freely in the space, without any need to attach these motions to particular body positions or locations. This perspective can augment spatial imagination and increase awareness of true *movement* sensation.

Simple Functional Movements Scored as Deflecting Inclinations

An informal method of representing motions with vector signs was explored in a notebook of simple functional movements with a theme of *right-left handedness*, documenting how movements may tend to be habitually performed in either a right-handed or a left-handed manner. This was undertaken as a personal diary, so *it is expected that others might perform these movements differently*.

Method of Observation, Analysis, and Motif

A method of observation emerged in accordance with the concept of dimensional-diagonal deflections. First, the *general* diagonal of a motion might be identified, then the major dimension deflecting that diagonal was specified, or the reverse might occur, first seeing the major dimensional component, and then noticing the general diagonal. These two processes were equivalent, though, in personal practice, the general diagonal seemed usually to be the first element identified.

A motif format evolved to fit the motions documented, attempting to be as *analogue* as possible, and to create a virtual image viewed from behind the moving body. Notation signs and arrows were used creatively, but generally the notation begins at the signs for a *center-of-mass of a body part*, and then follows the arrows in the direction of the vector signs. Additionally, the sign for the *whole body*, such as used for *patterns of whole-body connectivity*,[49] was placed in the center of the motif, and indications for bodily organization could be added.

Folding the Arms

One of the first and most common movements documented follows the process of folding the arms (Fig. 18). Motions of the right and left arms' centers-of-mass are indicated by vector signs at the end of directional arrows. This example demonstrates the two-part method of observation, where the diagonal vectors are first noted, and then the vector signs for the deflections of those diagonals are specified.
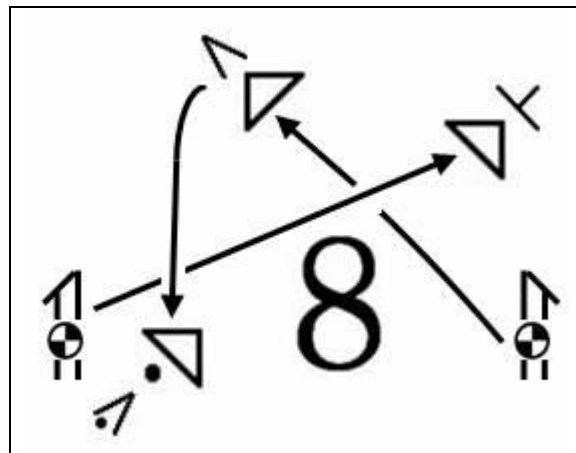

Fig. 18. Folding the arms.

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49. Peggy Hackney, *Making Connections - Total Body Integration through Bartenieff Fundamentals* (Amsterdam: Gordon and Breach, 1998).

The arms accomplished the action of *folding* as a kind of *axis and equator*. The left arm created an axis in a *single phase motion* along the diagonal forwards-upwards-rightwards (deflecting laterally, as a flat inclination of that diagonal). At the same time the right arm created an equator in a *two phase motion*, first along the diagonal upwards-rightwards-forwards (vertically deflecting steep inclination) and then turning along the diagonal downwards-backwards-leftwards (deflecting as another steep inclination).

Overall, there was a flat inclination of the left arm, surrounded by a sequence of two steep inclinations of the right arm (steeply up, then steeply down). The entire event seemed to end with a gentle impact as the right arm is *cradled*, resting on top of the left.

Picking Something Up, Off of the Floor

Left arm and left leg centers-of-mass: *suspended* inclinations (hovering) back-up-rightward	*(an object on the floor)*	Right arm center-of-mass: *steep* inclination (reaching) down-left-forward .... Right leg: (standing) (pivoting)
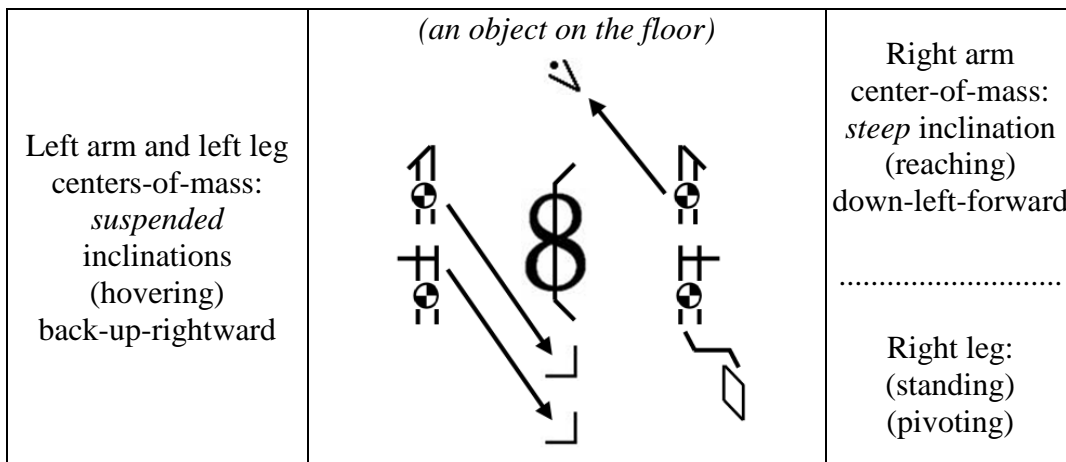
Fig.19. Reaching down and picking something up, off of the floor.

Figure 19 shows the action of picking up a small object. Here, the right arm center-of-mass follows a *steep vector* (mostly downward, and a bit forward, leftward), narrowing across the body, to reach towards an *object on the floor*. At the same time the left arm and left leg perform the same *suspended vector* (mostly backwards and a bit upwards and rightwards). These two actions of reaching and counterbalancing are integrated in a homolateral body organization (body-half). Interestingly, this body organization is similar to a ballet *first arabesque*.

The combined action of the right side reaching forward and the left side counterbalancing backward creates a slight turning motion of the entire body, thus pivoting slightly with the right leg standing on the floor.

Overall, this pattern reflects how, *in this case study*, the entire right side of the body appears to be stronger (standing, pivoting, and reaching) while the left side (weaker side) just suspends in the air, sensitively maintaining balance.

Transferring the Weight to the Floor

The action of transferring the body weight to the floor was explored using either the *stronger*, right arm (Figure 20) or using the *weaker*, left arm (Figure 21).
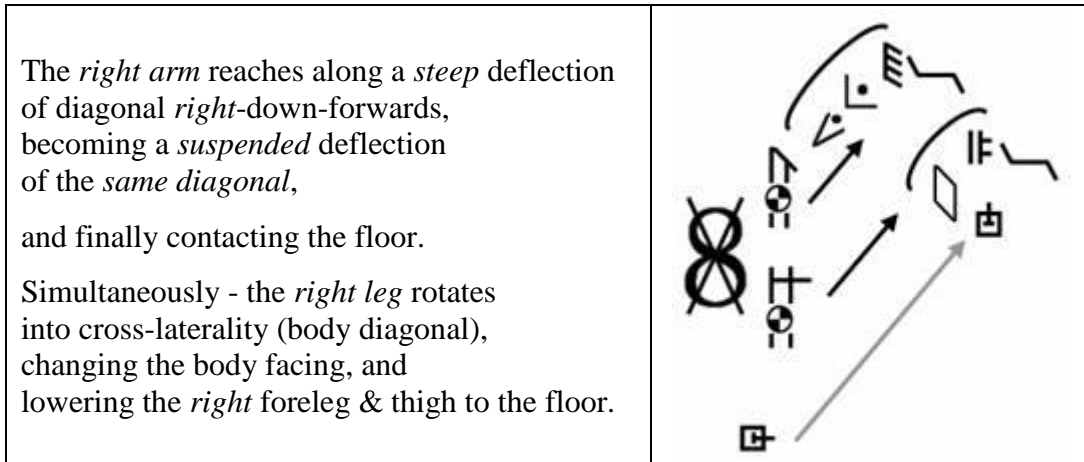
The *right arm* reaches along a *steep* deflection of diagonal *right*-down-forwards, becoming a *suspended* deflection of the *same diagonal*,

and finally contacting the floor.

Simultaneously - the *right leg* rotates into cross-laterality (body diagonal), changing the body facing, and lowering the *right* foreleg & thigh to the floor.

Fig. 20. Transfer to the floor with the right, *stronger arm*.

The *left arm* reaches along a *steep* deflection of diagonal *left*-down-forwards, becoming a *suspended* deflection of *a different diagonal*,

and finally contacting the floor.

Almost simultaneously—the *left leg* rotates into cross-laterality (body diagonal), changing the body facing, and lowering the *left* foreleg and thigh to the floor.
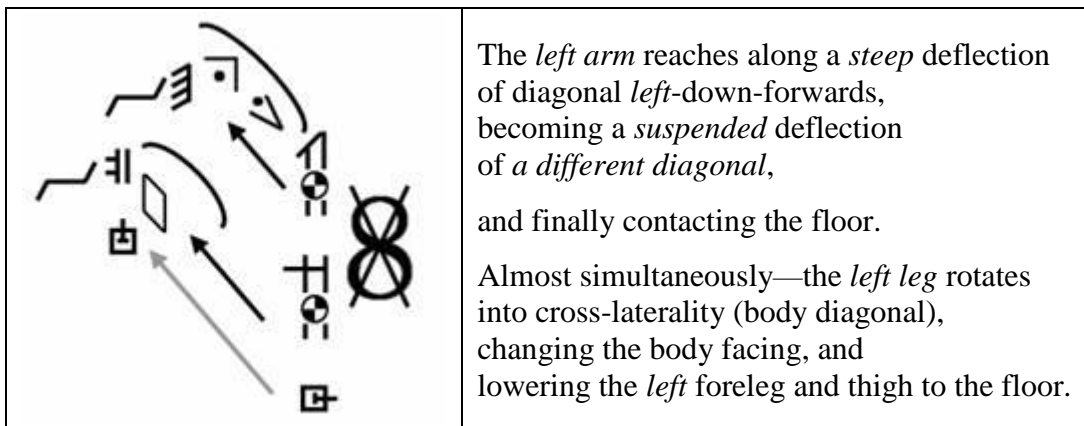
Fig. 21. Transfer to the floor with the left, *weaker arm*.

In *this case study*, the two examples (Figs.20 and 21) both use a sequence of: *steep - suspended*, perhaps to initiate with *steepness*, gaining momentum, and then using *suspension* to slow the movement and *hover* just before landing. Both versions also turn to the left, perhaps indicating a habitual *sidedness* in the torso. The main difference is that the stronger-arm just follows one diagonal all the way to the floor, while the weaker-arm turns from one diagonal to another. This turn may function to increase the *hovering quality* of the *suspended inclination* and also to keep the weaker arm closer to the whole-body center-of-mass.

Rudolf Laban's Choreutics as Deflecting Diagonal Motions

The modern-day practice of *Choreutics*,[50] also known as *Space Harmony*,[51] has come to be primarily based on concepts of locations in space which are arranged according to vertices of polyhedra, especially the five regular solids: tetrahedron, cube, octahedron, icosahedron, and the dodecahedron. Practitioners visualize themselves in the center of one or more of these polyhedra, with the polyhedral vertices taken as *points*. These points at the polyhedra vertices are represented with Labanotation direction symbols, which practitioners use as a kind of point-to-point guide while moving and creating "trace forms" in the space.

Labanotation directions symbols and associated vocabulary ("side high," "forward low," etc.) reinforce the conception of *positions* of the limbs and *locations* or *points* in space. The embodied result reflects the concepts of the notation and the verbal language. Emphasis is typically on producing a series of positions or points: starting at one position (one point), then moving to the next position (the next point), etc., often becoming gestural, as if writing in the space.

When considering spontaneous movement in the real world, it can be seen that the variety of movements often do not fit neatly into pre-conceived networks of points or positions. Human diversity does not correspond to regular shapes of polyhedra, and *diversity is the rule*, not the exception.

Laban's vector signs and the embedded concept of deflections (deviations) provide an alternative approach. In *movement observation*, qualities of diversity are inherent in the concept of *deflections between a dimension and a diagonal*. Identifying points or positions is not required. Instead, motions can be identified from two aspects: (1) the general *diagonal* orientation of the slope, and (2) the largest *dimensional* component of that slope. These two features define broad categories of vectors according to Laban's concept of deflecting inclinations.

Likewise, in *choreutic practice*, vector signs offer an alternative to the approach of points and positions. Conceiving of inclinations as deflecting diagonal orientations (slopes) represented in vector signs, allows choreutic forms (scales, rings) to be immediately embodied as lines of motion along orientations that can begin from an infinite number of possible starting places.[52] This leads away from the concept of point-to-point embodiment, which is so often evident in choreutic practice. Envisioning continuously deflecting inclinations increases the potential for greater organic variation in the embodiment of bodily forms in space, thus opening the field for the broadest range of expressive formations and varieties of harmony which are representative of human diversity.

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50. Laban, *Choreutics*.
51. Dell, *Space Harmony, Basic Terms*.
52. Longstaff, "A Free Space Vector Approach to Laban's Choreutics."

Published by University of North Carolina at Greensboro, 2019, previously at LMU, 2018.

27

Conclusion: Rudolf Laban's Painful Compromise, and an Old Dream

In the years before 1920,[53] Rudolf Laban created methods for *movement* notation that were published in 1926 in *Choreographie*, a book that Laban later recalled as "the struggle for the new directional signs."[54] Much of this struggle centered on "the problem he tried to solve, [which] was how to write *motion*, not only positions passed through, a task which proved to be extraordinarily difficult."[55]

Soon after *Choreographie*, the 1st Dancers' Congress was held in Magdeburg (June, 1927) with many discussions regarding requirements for dance notation. This was immediately followed by the Laban Summer School at Bad Mergentheim, (July-August, 1927) where conversations from the Dancers' Congress continued, and several important decisions were made about the *dance script* which formed the foundation of Labanotation/Kinetography.[56]

One "question occurred again and again—should the signs [...] show the movement in the *direction* or the *final goal*, the position achieved."[57] This "heady discussion focused on whether it was practical to write all movements as progressions in space [... or to notate limb movements as a series of positions] by stating the places passed through."[58] After much discussion and debate, it was finally agreed that "gestures were best expressed as positions passed through,"[59] and this choice from 1927 continues into Labanotation/Kinetography today, where "*movement is the transition from one point to the next*."[60]

For Laban, this decision led to mixed emotions where "jubilation followed painful compromise;" *jubilation* because a decision was made and the notation system could be published, yet this also came as a *painful compromise* because "Laban wanted at all costs to defend that he was writing motion, not positions."[61]

Soon afterward, the notation system was presented at the 2nd Dancers' Congress in Essen, and publications and establishment of institutes for promoting dance script soon followed.[62] However, also after this time, Laban lost interest in this area and turned over responsibilities for the notation system to others.

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53. Valerie Preston-Dunlop, *Rudolf Laban* (London: Dance Books, 1998), 110.

54. Rudolf Laban, *Principles of Dance and Movement Notation* (London: MacDonald & Evans, 1956), 7 note †.

55. Valerie Preston-Dunlop and Susanne Lahusen (Eds & Trans), *Schrifttanz; A view of German Dance in the Weimer Republic* (London: Dance Books, 1990), 25. [italics, mine]

56. Preston-Dunlop, *Rudolf Laban*, 129–132.

57. Gertrud Snell-Freidburg, "The beginnings of kinetography Laban," *Laban Art of Movement Guild Magazine* 63 (Nov.1979): 11–13. [italics, hers]

58. Preston-Dunlop, *Rudolf Laban*, 132.

59. Ibid.

60. Ann Hutchinson, *Labanotation* (New York: Theatre Arts Books, 1977), 15, 29.

61. Preston-Dunlop, *Rudolf Laban*, 131–132

62. Ibid. 129–132.

This issue of *points versus motions* continued to arise at other times. Warren Lamb, a former student and also a long-time colleague of Laban, recounted an occasion in 1947 or 1948 at the Art of Movement Studio in Manchester England when Rudolf Laban was observing a session where students were demonstrating their teaching abilities by teaching other students:

> A student […] was having to take a class in front of Laban on a space harmony study. […] So she […] started by saying, "I want you to start at the icosahedron point 2" […] And Laban fumed and said "This is not a point! This *2* is a *movement* and not a *point*, what we are doing here is movement, you don't understand!" and he really attacked her so fiercely. She continued in a very, *very* belated way, and then […] retired for the rest of the day […] and [soon] just left and went back to New York. He may have felt it was a fundamental misunderstanding that she is really talking about fixed positions as though that's movement. In that case, I think, he felt a threat to his basic principles and philosophy.[63]

In spite of his *painful compromise* in 1927, Laban remained committed to the goal of conceiving and notating *movement as motion*. This motivation was expressed again formally when writing what was planned to be his first book introducing the subject in England, in 1939. In some of his closing remarks to this major English work, *Choreutics*, he visualizes a "*free space*" with "an infinite number of parallel inclinations [that] do not go through the centre [and] are not bound to a centre, but occur anywhere in our surrounding space," and then proposes another method for notating motions—this time using Labanotation *diagonal* direction symbols combined with letters indicating the *dimensional* deflection of that diagonal motion (see Table 5), calling these "simplified symbols" for "*free inclinations*" or "*free space lines*" in "free space."[64]

Finally, recalling his vision from the 1920s, Laban projected this desire into the future as an imperative, charging *us* with a responsibility:

> The future development of kinetography *must* include the possibility of recording forms in free space […] the conception of a notation capable of doing this is an old dream in this field of research.[65]

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63. Jeffrey Scott Longstaff, "What makes Laban so angry? A Conversation with Warren Lamb," *Action Recording* (Surrey, England; Labanotation Institute) 91/92 (Feb.2003): 7–11. (Excerpts from an interview with Warren Lamb in Old Isleworth, England, 8th of August, 2001) [italics, mine]

64. Laban, *Choreutics*, 125–130.

65. Ibid. [italics, mine]

Appendix: Reading Vector Signs

Thirty-eight notation signs were used extensively by Rudolf Laban in his 1926 German book *Choreographie*. Since then these signs were rarely used and their meanings were forgotten. In recent years these signs were translated into modern-day Labanotation,[66] revealing how the *motion* concepts embedded in these signs were an early form of kinetography which later evolved into the *position* concepts currently used in Labanotation and also Choreutics[67] (*Space Harmony*[68]). This appendix gives an overview of how to read the 38 vector signs, and also offers several translations of each vector sign into Labanotation direction symbols.

38 Vector Signs (6 Pure Dimensions, 8 Pure Diagonals, 24 Inclinations)

Table 9. Thirty-eight Vector signs	*6 pure dimensions*					
	left	right	up	down	fore	back
up-right-forwards						
down-left-backwards						
up-left-forwards						
down-right-backwards						
up-left-backwards						
down-right-forwards						
up-right-backwards						
down-left-forwards						
8 pure diagonals	Flat		Steep		Suspended	
	24 inclinations (deflecting diagonals)					

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66. Longstaff, "Translating vector symbols from Laban's 1926 Choreographie."

67. Laban, Choreutics.

68. Dell, *Space Harmony*.

Table 9 displays the complete group of all *38 vector signs* that are used in the notated sequences in Rudolf Laban's 1926 German book *Choreographie*. The layout of the table gives an idea of how to read the notation signs. All the signs are related together as a group, following the same design and representation of lines of motion. Their arrangement in the table can be a key to reading the signs.

The 6 pure dimensions. Looking at the signs for the *6 pure dimensions,* it can be seen that, just like modern-day Labanotation, the signs represent a *view from above*, looking downward. Thus the dimensional sign for *left* points to the left of the page, and the sign for *right* points to the right. In the same way, the sign for *forward* points to the top of the page, and the sign for *backward* points to the bottom of the page. The dimensional signs for up and down are slightly different than Labanotation. The sign for dimensionally *upwards* is just an empty square, and the sign for dimensionally *downwards* is the square containing a black dot.

The 8 pure diagonals and 24 inclinations (deflecting diagonals). The signs for *pure diagonals* and for *deflecting diagonals* (also called *inclinations*) are similar, though they are also very different from modern-day Labanotation. Generally, all of the signs for diagonals and inclinations can be read according to a simple rule:

If there is a *dot*, then move *downwards* in the *direction of the dot*.
If there is *no dot*, then move *upwards* in the *direction of the point*.

The signs for the 8 pure *diagonals* can be taken as prototypes for the 24 inclination signs. If the diagonal sign has a *black dot*, then the movement is *diagonally downwards*. Likewise, if there is *no dot*, then the movement is *diagonally upwards*.

This means, that if the diagonal sign has *no dot*, then the movement will be diagonally *upwards in the direction of the point* of the sign (the 90° angle on the sign). On the other hand, if there is a *black dot*, then the movement will be diagonally *downwards in the direction of the dot*.

Notice that these diagonals are all in three-dimensions (as if they were inside of a cube). *There are not any vector signs for planar diagonals.*

The signs for the 24 *deflecting diagonals* (also called *inclinations*) follow the same pattern as the signs for *pure diagonals*. The only difference is in what might be regarded as the *point* of each sign. The point of each sign can be seen by looking at Table 9.
- For *flat inclinations*, the *point* of the notation sign is the *short single line*.
- For *steep inclinations*, the *point* of the sign is the *sharp angle*.
- For *suspended inclinations*, the *point* of the sign is the *90° angle*.
- A *dot* always indicates *downward* motion, in the direction of the dot.

Overall Features of the 38 Vector Signs

No sign for center. Each vector sign indicates the orientation (slope) of a line. Hence, there is not any sign for *center*. Logically, this is because center is a location; it is not a line. This emphasizes Laban's approach, which was to write lines of movement (*not* poses, positions, or locations).

No signs for planar diagonals or corners of the 3 cardinal planes. The 38 vector signs do not include any signs for planar diagonals or corners of the three *cardinal planes*. Years later, Laban revised the spatial organization and called these "diameters,"[69] though "planar diagonals" (or "plane diagonals") would be a more precise geometric description and this was the concept used by Sylvia Bodmer,[70] Laban's close colleague in the area of Choreutics and space harmony.

This absence of signs for planar diagonals or corners of the three cardinal planes seems to indicate that Laban's envisioned movement in *three dimension*s, with one-dimensional space and two-dimensional planes being only considered as *concepts for orientation*, but not as *actual forms* of body movement.

This approach appears to be evident in the notated sequences in *Choreographie*, which almost exclusively use the inclination vector signs (deflecting diagonals). On the other hand, the vector signs for pure diagonals are *never* used in any notated sequence, and the vector signs for pure dimensions are only rarely, and even then, scarcely used. When they are used, the dimensional signs never form the main part of the sequence, but only function as short transitions, linking one series of inclinations with another.

These characteristics appear to indicate that Laban used pure dimensions and pure diagonals primarily as a *frame of reference* for the inclinations, and it is these 24 inclinations which constitute the *actual substance* of body movement.

One basic sign for both directions of a line. One other interesting feature of the vector signs is that, for the 8 pure diagonals and the 24 deflected diagonals (inclinations) there is, essentially, *one sign* for *each line*. This feature signifies how the essential spatial element was considered to be the orientation (slope) of a *line*. For example, whether moving *up* an inclination, or *down* that same inclination, both movements will have the same slope. This slope (orientation) is taken as the essential feature to be notated. Thus, each slope is given one notation sign, and that single sign is used in two variations, either with a dot (moving *down the slope*), or without any dot (moving *up the same slope*).

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69. Laban, *Choreutics*, 15–16, 101-102.

70. Sylvia Bodmer, *Studies based on Crystalloid Dance Forms*. (London: Laban Centre, 1979), 14.

Vector Signs and Direction of the Progression Signs

When translating vector signs into modern day notation signs, it can sometimes be helpful to use the "direction of the progression" signs.[71] Similar to vector signs, these signs also represent lines of motion. The signs are constructed by taking a normal Labanotation direction symbol and placing an arrow inside of that symbol; then this modified notation symbol does *not* represent a *limb position* (as it normally would in Labanotation). Instead, it has become a *direction of the progression sign* and indicates the orientation (slope) of a *line of motion*.

Some of these *direction-of-the-progression signs* are used below to define the meanings of some of the *vector signs*.

Infinite Possible Translations

It is important to note, that a vector sign will *never* have only one possible translation. The vector only defines the slope of a line, but it *does not specify where that line is* in space.

The location of the vector might be discovered by knowing where the vector begins, or where it ends. When the starting place is known, then the vector defines the orientation (slope) in which to move, beginning from the starting place. Otherwise, performers could begin wherever they please, or start the vector from wherever they are, or from wherever any part of their body is.

Further, each vector sign does not define an *exact* orientation (slope). There are infinite possibilities for angles of slopes. The system of vector signs, as designed by Laban, divides the infinite possibilities for slopes into *24 categories*. Each category is defined by one pure diagonal direction (8 possibilities), multiplied by (deflected by) one pure dimension (3 possibilities) (i.e. 8 x 3 = 24).

Within each of the 24 categories of inclinations, there is still an infinite number of possibilities because there are an infinite number of parallel lines (lines with the same slope).[72] The exact orientation can also vary within the range of each of the 24 categories of inclinations, that is, an infinite number of lines with *almost* the same slope (all within the range of one of the 24 categories of inclinations).

With these factors in mind, it should be remembered that the translations of vector signs given below are only *a few possibilities* (the most regular or most simple translations of a vector), but in reality (and perhaps this is one of the highlights of vector signs) *each sign has infinite possible translations*.

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71. Hutchinson Guest, *Your Move*, 261.
72. Laban, *Choreutics*, 128.

Vector Signs Translated into Labanotation Direction Symbols—Introduction

The tables below give some possibilities for translating each of the vector signs. The translations are given in Labanotation *direction symbols* (written under a phrase bow, and read from left to right), or in *direction of the progression signs*.[73]

Each vector sign should be seen as a *category* of movement orientations with an infinite number of members within the range of each category. The translations given here are the standard, most regular translations. The actual translation will depend on many things, such as the starting location. A vector is an orientation of a *line of motion*, so its location depends on where it begins.

In these translations, Labanotation direction symbols are related to polyhedral networks: the octahedron, the cube, or the icosahedron, as indicated below. Also as indicated below, within the polyhedral networks, the lines of motion can be *central* (towards or away from the center of space), *peripheral* (around the edge of the space), or *transverse* (cutting though, between the center and the periphery).

Vector Signs for Pure Dimensional Orientations (slopes)

Table 10 shows several translations of vector signs for the *pure vertical*.

Table 10. *Dimensional* movements along the *vertical*, upwards or downwards

Vector sign	Direction of progression	Octahedron (central)	Cube (peripheral)		Icosahedron (transverse)	Icosahedron (peripheral)

Table 11 presents several possible translations for vector signs which are purely in the *lateral dimension*.

Table 11. *Dimensional* movements along the *lateral*, leftwards or rightwards

vector signs	Direction of progression	Octahedron (central)	Cube (peripheral)		Icosahedron (transverse)	Icosahedron (peripheral)
>						
<						

Table 12 presents several possible translations for vector signs which are purely in the *sagittal dimension*.

Table 12. Dimensional movements along the *sagittal*, forwards or backwards

Vector signs	Direction of Progression	Octahedron (central)	Cube (peripheral)		Icosahedron (transverse)	Icosahedron (peripheral)
∧						
∨						

Vector Signs for Pure Diagonal Orientations (slopes)

Table 13 lists translations for each of the 8 vector signs for pure diagonally oriented motions. These orientations all carry equal degrees of vertical, lateral, and sagittal orientations. This is in contrast to the deflected diagonals which have irregular mixtures of vertical, lateral, and sagittal.

Table 13. Some possible translations of the 8 vector signs for purely diagonally oriented movement

Vector signs	Text	Direction of progression	Labanotation direction signs
	up right forwards		
	down left backward		
	up left forward		
	down right backward		
	up left backward		
	down right forward		
	up right backward		
	down left forward		

Inclinations—Deflections of the Diagonal: Left-Down-Fore/Right-Up-Back

Table 14 and Table 15 present a few possible translations of vector signs for flat, steep, and suspended deflections of the diagonal:

leftwards-downwards-forwards/rightwards-upwards-backwards

Table 14. Translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *leftwards-downwards-forwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		*LEFT* downward (forward)				
Steep, vertical deflections		*DOWN* forward (leftward)				
Suspended, sagittal deflections		*FORE* leftward (downward)				

Table 15. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *rightwards-upwards-backwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		*RIGHT* upward (backward)				
Steep, vertical deflections		*UP* backward (rightward)				
Suspended, sagittal deflections		*BACK* rightward (upward)				

Inclinations—Deflections of the Diagonal: Right-Down-Fore/Left-Up-Back

Table 16 and Table 17 present a few possible translations of vector signs for flat, steep, and suspended deflections of the diagonal:

rightwards-downwards-forwards/leftwards-upwards-backwards

Table 16. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal of *rightwards-downwards-forwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		RIGHT downward (forward)				
Steep, vertical deflections		DOWN forward (rightward)				
Suspended, sagittal deflections		FORE rightward (downward)				

Table 17. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *leftwards-upwards-backwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		LEFT upward (backward)				
Steep, vertical deflections		UP backward (leftward)				
Suspended, sagittal deflections		BACK leftward (upward)				

Inclinations—Deflections of the Diagonal: Left-Down-Back/Right-Up-Fore

Table 18 and Table 19 present a few possible translations of vector signs for flat, steep, and suspended deflections of the diagonal:

leftwards-downwards-backwards/rightwards-upwards-forwards

Table 18. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *leftwards-downwards-backwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		LEFT downward (backward)				
Steep, vertical deflections		DOWN backward (leftward)				
Suspended, sagittal deflections		BACK leftward (downward)				

Table 19. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *rightwards-upwards-forwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		RIGHT upward (forward)				
Steep, vertical deflections		UP forward (rightward)				
Suspended, sagittal deflections		FORE rightward (upward)				

Inclinations—Deflections of the Diagonal: Right-Down-Back/Left-Up-Fore

Table 20 and Table 21 present a few possible translations of vector signs for flat, steep, and suspended deflections of the diagonal:

rightwards-downwards-backwards/leftwards-upwards-forwards

Table 20. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *rightwards-downwards-backwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		RIGHT downward (backward)				
Steep, vertical deflections		DOWN backward (rightward)				
Suspended, sagittal deflections		BACK rightward (downward)				

Table 21. A few translations of flat, steep, and suspended vector signs for inclinations deflecting from the diagonal *leftwards-upwards-forwards*

Deflection	Vector signs	Text	Labanotation direction symbols			
			Icosahedron, *transverse*		Icosahedron, *peripheral*	
Flat, lateral deflections		LEFT upward (forward)				
Steep, vertical deflections		UP forward (leftward)				
Suspended, sagittal deflections		FORE leftward (upward)				

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