Pendulum

Dorothea Weise

Theoretical approach

The principle of the pendulum, the oscillation through the rest position to one side and then to the other, is perceived as a two-periodic by the reversal points. At the same time, the pendulum is characterised by continuity because gravity immediately pulls the pendulum back toward the rest point when the apex is reached.

When swinging, the potential energy of the mass is transformed into kinetic energy and back again. In the rest position, the total energy of the oscillation is present as kinetic energy, at the apex as potential energy.

Swinging and oscillating are very pleasurable movements in gymnastics and dance when the release into gravity is economically combined with the sensation of being carried upward. Rudolf von Laban has distinguished the following forms of swings based on the principle of pendulum:[1]

- Pendulum Swing (as described above)
- Centrifugal Swing: centrifugal momentum is created by magnifying and optimally utilising gravity so that the swinging parts move circularly around their axis.
- Scooping and Spreading: The scooping motion of the right arm is clockwise toward the body and is usually guided by the inside of the hand or arm. The scattering movement moves away from the body in a counterclockwise direction and is usually guided from the outside of the arm. Both movements can serve as preparation for each other.
- The Eight Swing: A continuous swing that alternates between scooping and scattering.

These are all swings that use falling as an impetus to climb (pendulum principle). If we reverse the principle, the movement starts with a lift and then falls. This is called Inverted Swing.

In the spatial directions differentiated by Laban, there are numerous possibilities to organise swings and pendulum movements between spatial points as shown in the following figure for the so-called swing scales (Schwungskalen):[2]

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[1] Summarised in: Jean Cébron, *Das Wesen der Bewegung. Studienmaterial nach der Theorie von Rudolf von Laban* in: Urs Dietrich: Eine Choreographie entsteht. Essen: Blaue Eule, 1990, p. 82-84

[2] Rudolf von Laban, Grundlagen der Raum-Harmonielehre des Tanzes, Wilhelmshaven: Noetzel, 1991/ Rudolf Laban, Choreutics, London: Macdonald & Evans, 1966

Practical approach

Figure eight movement of the upper arm at the shoulder joint. Start small, then increase. Change direction. Same with thigh bone at hip joint.
Arm pendulum: Clarify three basic directions: frontal, sagittal, horizontal. Play with different size, permeability, tempo, one/two-sidedness, force/tension of the three directions of movement.
In pairs: Person A does an arm pendulum forward/back unilaterally. B swings in and then intervenes with tactile stimuli. Pick up energy, amplify, inhibit.

Exploration on Xenakis: 'Pléiades' for 6 percussionists (1979), Métaux. Vary initiation, intensity of fall, extent of movement, tempo, permeability.
Each person chooses a type of pendulum. In groups: A does her pendulum. B and C observe the movement. How can one swing into this movement with one's own movement and a moment of physical accompaniment? In addition, the movements found for this should have a different timing than the original pendulum. Finding a form together. Build up and break down.
Improvise again to the piece Métaux from Iannis Xenakis and build up spontaneously pendulum construction in groups.

Make an experiment: Listen to Christian Wolff, 'Keyboard Miscellany III'. Choose one pendulum movement and let the musical impulses bring your movement to standing still and again release.
Have a look to this video about pendulums in different lengths producing waves and chaotic phases: https://www.youtube.com/watch?v=V87VXA6gPuE
Inspired by this, groups of 4-5 participants develop and show a small movement piece.
Watch the video associated with this text.

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