

Matter and Memory

The true effect of repetition is to decompose and then to recompose, and thus appeal to the intelligence of the body...In this sense, a movement is learned when the body has been made to understand it...Now the logic of the body admits of no tacit implications. It demands that all constituent parts of the required movement shall be set forth one by one, and the put together again.¹

Henri Bergson

Instructions for climbing a stair

A stair may be considered as a body-double, extended beyond our own natural body. The body of a stair bearing a double index: one iconic, as the material outline of movements already executed in its fabrication; another instrumental, as a further appeal to the body in anticipation of renewed movement. But the work of manufacture and assembly of a stair is in one sense the same and in another not the same as climbing a stair.

It shouldn't have escaped anyone's attention that often the floor folds in such a way that part of it climbs at a straight angle to the plane of the floor, and the next part is positioned parallel to this plane, giving way to a new perpendicular, a behavior that is repeated in a spiral or a broken line, reaching heights that are extremely variable.²

The project of construction of a stair is a concrete example of work executed not on the basis of immediate need, but according to a desire, a will of production, and expenditure of time. That is, when constructing a stair I am not yet using it, but rather I am using my body. The sensor-motor mechanism of my body is spending its energy by moving, shaping and allocating outlying materials according to a spatial diagram.

Bending down and putting the left hand on one of the vertical parts, and the right on the corresponding horizontal, one is in brief possession of a step.³

The diagram is an attempt to reconstruct in space the memory already encoded in the body corresponding to the experience normally associated with the name: *stair*. It bids the body to discriminate and classify; it defines what is sufficient and necessary; it traces, within the total movement, the lines that generate its internal structure. It has no further intention.

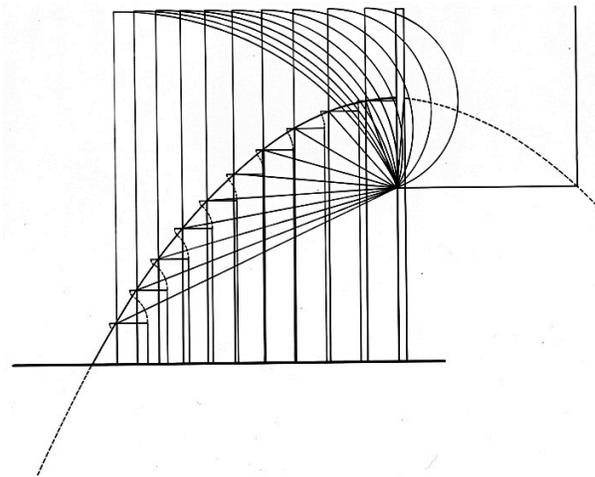


Fig. 1. Stair: motion diagram.

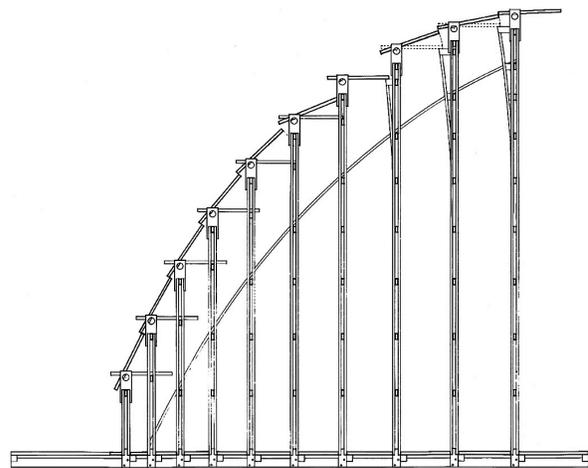


Fig. 2. Stair: elevation

Each one of these steps, formed as is evident by the two elements, is placed a little higher and in front of the previous one, a principle that gives its sense to the stair, since any other combination will produce forms perhaps more beautiful or picturesque, but incapable of transferring from the ground level to the first floor.⁴

It is true, that during the assembly the body is transporting itself, climbing as it were by the effect of its own work. The work acting as a temporary scaffolding which moves the body up for no other purpose than reaching its proper completion.⁵ Once complete, the construction must be released to a condition of uselessness, having reached its own material autonomy. In its positive sense the finished work is no longer a proposition of work, but one of play—or perhaps use.

Steps must be climbed head on, since backwards or aslant they become particularly uncomfortable.⁶

The movements of the body during the act of construction do not correspond necessarily to the act of climbing. They are most likely superabundant and not directed towards comfort but technical efficiency. The body of a stair, as a material synthesis, conceals within its mass most of the redundant movements and releases to perception a clarified visual diagram. This diagram resembles the dynamic of climbing, revealing to the body the instrumental capacity of the stair: it bids the body an invitation to climb. The perception of the external object provokes in our part a dynamic attitude, prompting the memory encoded in the body to retrace its movements. It is simply a one-to-one exchange, without an ulterior motive, issuing instructions for climbing.

The natural attitude is that of staying on your feet, the arms dangling without effort, the head erect but not so that the eyes cannot see the steps immediately above the one you are stepping on, and breathing slowly and regularly.⁷

To begin construction of a stair one needs to have the proper attitude, which is to remain attentive to the purpose of the project. Step by step, attention is realized as an adaptation of the body and the mind, realizing in this attitude of consciousness the consciousness of an attitude.⁸ The 'true utility' of a stair is, first and foremost, that of being useless for any purpose other than that of agreeing with the movements of the body, and supporting its power of action.⁹

When climbing a stair one must, begin by lifting that lower right part of the body, almost always wrapped in leather or suede, which save few exceptions fits exactly on the step.¹⁰

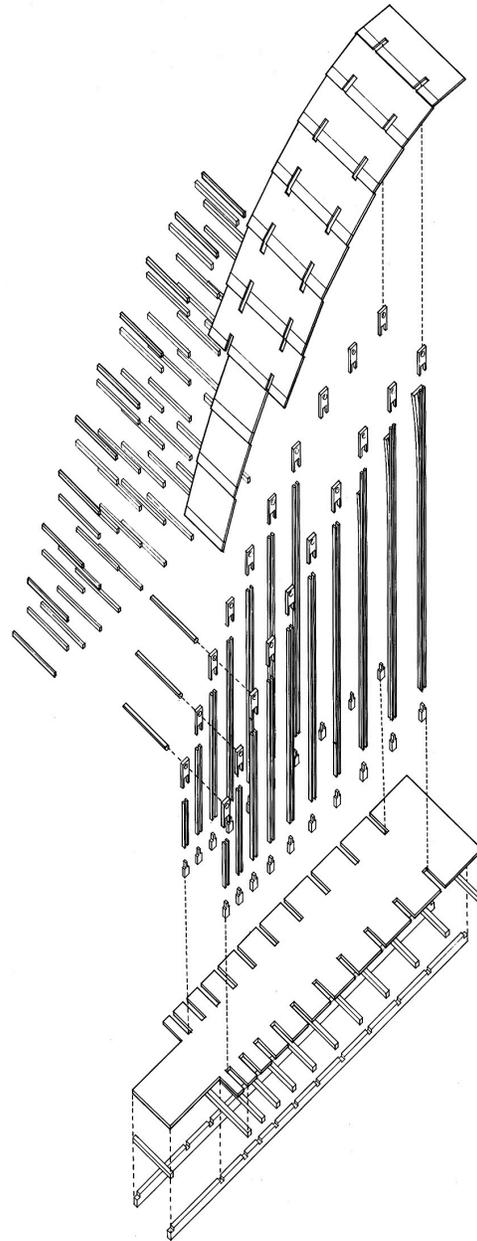


Fig. 3. Stair: exploded axonometric.

The dimensional ratio between a tread (horizontal) and a riser (vertical) determines the slope of a stair. Usually this ratio remains constant throughout the body of a stair. A possible effect of this constancy may be the uniform speed of movement of the body as it surmounts the slope, or inclined plane of the stair. A greater inclination slows down the movement and demands more expenditure of energy; conversely, a lesser inclination speeds up the movement and requires less effort from the body. To become sensitive to the nuances of speed (space over time), to the quality of the actual event of climbing, one may play with variations of slope in the contour of a stair. This would require a certain degree of "refinement in the perception of small differences."¹¹ To take this attitude even further, one needs to train oneself in the art of self-forgetfulness, and return to childlike playfulness. The secret of such innocence lies in the acceptance that "every act is a virgin act, even the repeated one." (Erik Satie)

Placing such part, which for the sake of brevity we will call foot, on the first step, one must then lift the equivalent part on the left (also called foot, but not to be mistaken with the aforementioned foot) and bring it to the height of the foot, making it to go forward and up, until it stands on the second step, upon which the foot will rest, and on the first step the foot will rest.¹²

The ratio between tread (level) and riser (plumb) is variable: the greater the ratio, the lesser the slope; and vice-versa. Usually the tread is made deep enough to accommodate the foot, more or less thirty centimeters. And, as a rule of thumb, the sum of two risers and one tread is sixty-four centimeters. This makes the height of the riser approximately seventeen centimeters. For no specific reason, other than habit, a stair leading to the attic, or cellar, is frequently made steeper than other stairs of a house. Forgetting the excuse, or pretext, that such a stair is "used less often," or is "less important," or the lack of space, one will find the body experience of climbing such stair more difficult, or just different.

The first steps are always the most difficult, until the necessary coordination is acquired. The coincidence of name between foot and foot makes the explanation difficult. Be especially careful of not lifting at the same time the foot and the foot.¹³

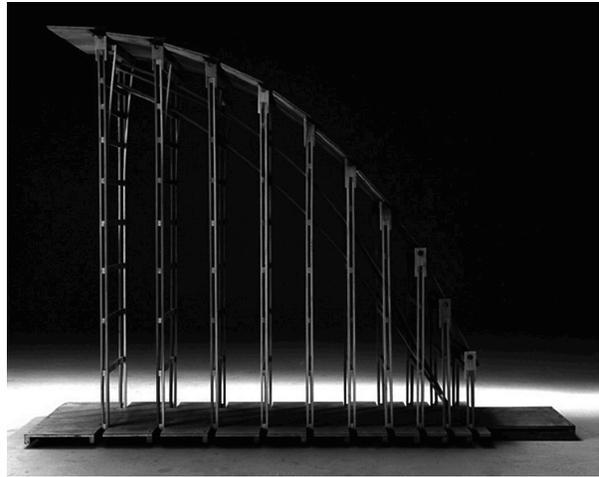


Fig. 4. Stair: side elevation.

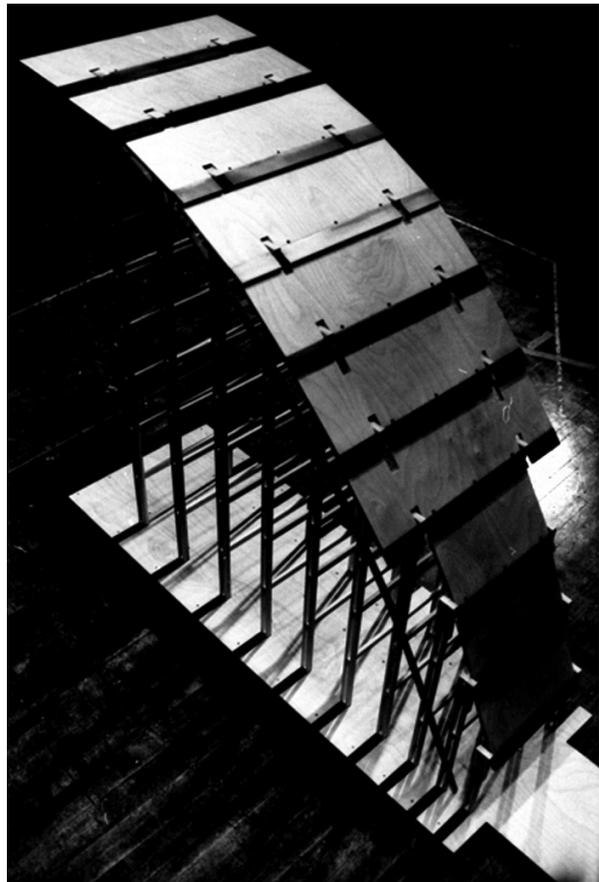


Fig. 5. Stair: front angle view.

There are events that come to us concealed under the appearance of everyday occurrences. In order to become sensitive to their quality as actual events we need to fine-tune our body—our sensual manifold—heightening the intensity of perception. A true perception requires contact and coincidence between the mind and the thing perceived. The most immediate thing perceived is our body; among other things, it is our center of affection and our center of action. To be more precise, "...our body, with the sensations that it receives...and the movements that it is capable of executing...is then, that which fixes our mind, and gives it ballast and poise."¹⁴ Climbing a stair is an act of defiance of gravity, as well as a balancing act. Step by step, it is a limited form of flight, abandoning the security of the ground to find it again relocated at a higher level. In its upward trajectory, the body performs a repetitive series of back and forth rotating movements: of the foot joints (metatarsal), ankles, knees, and hip joints as a function of load bearing; and, lateral sway of the torso, pendular movement of the arm at the shoulder, and slight flexion of the elbow as a function of balancing.

Arriving this way to the second step, it is sufficient to repeat the movements alternately until the end of the stair is found.¹⁵

The body carries forward and up, within itself, a volume of movements. The total sum of the movements produces a corresponding volume of space with an ever advancing boundary between the future and the past—the body itself being the point of passage, the

exact position of the present. The act of climbing is the diachronic unfolding and penetration of two volumes of space: the transitive space of my body and the passive space of the stair. These two have in common "similar differences" and "different similarities,"¹⁶ arousing the notion of interiority and exteriority, which is merely the distinction between my body and other bodies.¹⁷ The difference shown in a stair between tread and riser (level and plumb) is similar to the difference found in the sensory-motor mechanism of my body (inner ear) that allows upright dynamic equilibrium. The similarity between the steps of a stair, which exist all at once (coexistence), is different from the similarity between the steps taken by my body, not all at once but in different time (succession). Yet each new step to be taken depends on the existence of the steps previous to it (paradox of coexistence with the past). This involves the adaptation of the past to the present, the utilization of the past in terms of the present—what Bergson calls "attention to life." Thus the notion of time is introduced as a form of "internal sensibility" (Kant). Here, a pure being of the past, or imaginative memory of the mind (ontological memory), coincides with the immediate present, or memory encoded in the body (sensory-motor memory). Thus, the present is a point of animation when, during the act of climbing, my body attributes movement to the body of a stair.¹⁸

Exiting from it is made easy by a light tap of the heel that fixes it on its place, where it will remain until the moment of descent.¹⁹

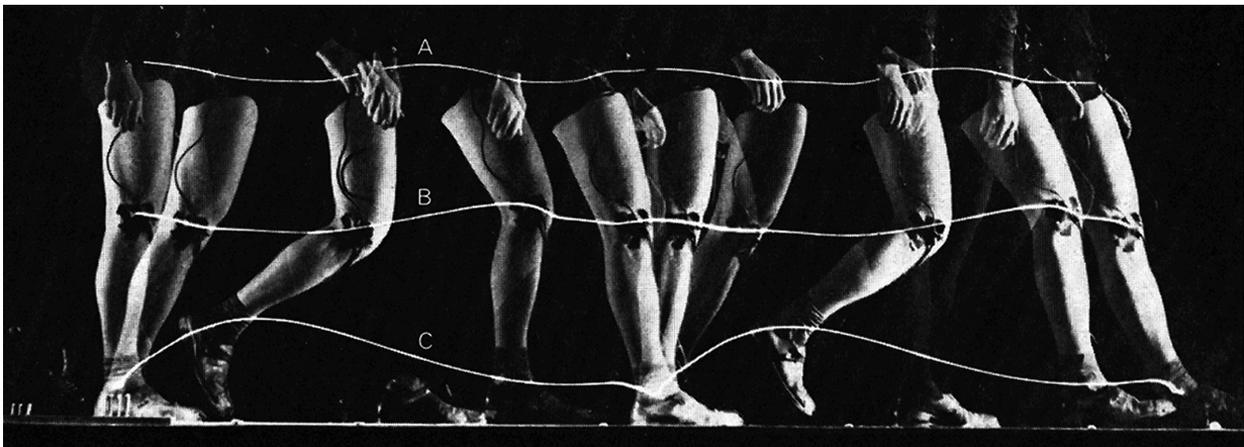


Fig. 6. Walking cycle extends from the heel strike of one leg to the next heel strike of the same leg. The photographs by Gjon Mili trace the progress of the right leg in the course of two strides. (Source: *Scientific America*, April 1967, 58)

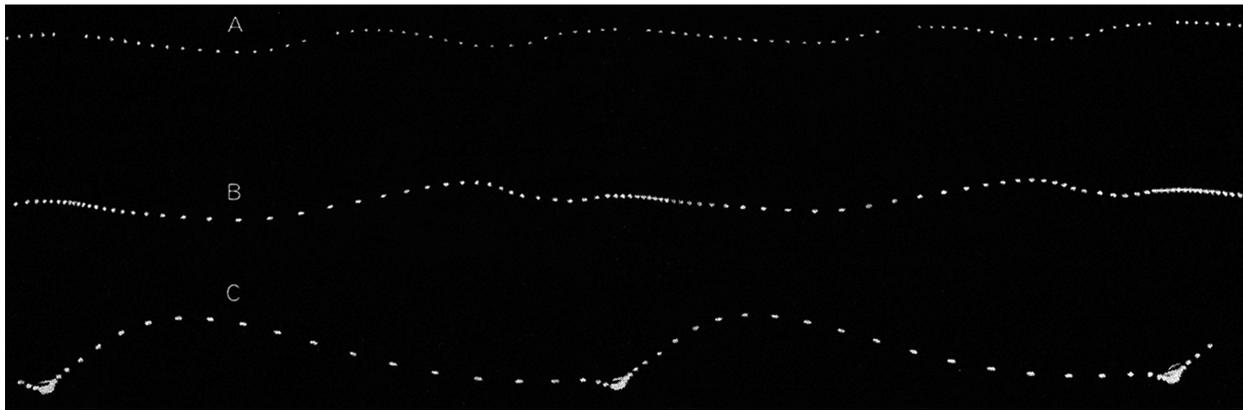


Fig. 7. Sine curves described by the hip (A), knee (B) or ankle (C) of a walking human body. The speed is determined by measuring between dots. (Source: *ibid*, 58)

As a function of gravity, the ball of my foot on the tread makes the main contact of my body with the body of a stair. But as a function of dynamic equilibrium, of upright body posture, my hand may seek to touch again the stair and reaffirm its flow on the *handrail*. It is there that I bring the diagram of movement into close reciprocity and bring the memory of the body to the hand: the quintessential haptic organ and original organ of manufacture.

Manufacturing instructions

In order to construct a stair, the following steps are required:

1. Two-dimensional kinesthetic diagrams, which may be produced by rendering, photomontage, etc., showing up and down movement of the body.
2. Geometric drawings, which give precise outlines and measurements to the motor diagrams and approximate boundary of the body-double, i.e., stair.
3. Construction drawings, which determine the possibility of technical execution of the stair-body in a given material, i.e., metal or wood.
4. Full size construction of a step in the chosen material. And, reproduction of a sufficient number of steps to be assembled as a stair, reciprocating the motor diagram of the human body as a three-dimensional artifact.
5. Assembly and testing of the stair as a functional artifact, animating the experiment in its present sense, and giving to it a practical verdict.

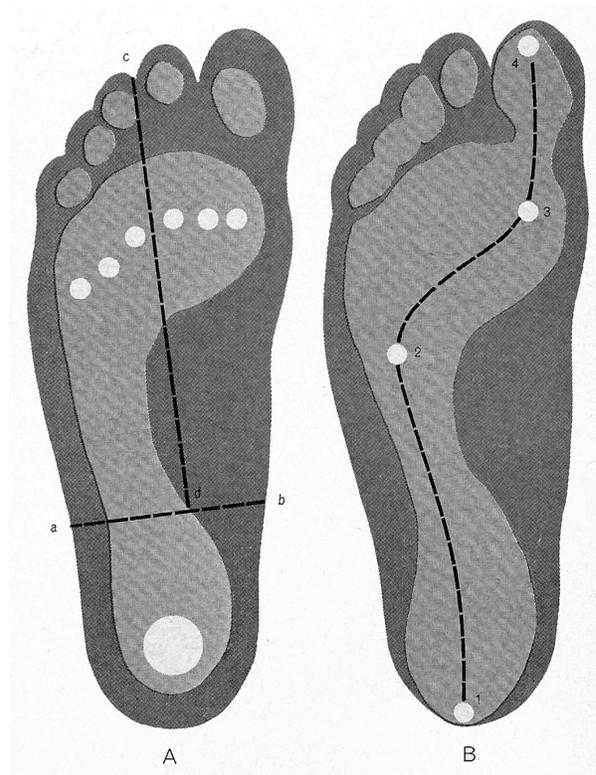


Fig. 8. Distribution of weight alters radically as movement takes place. Static load at rest (A); dynamic redistribution when striding (B). (Source: *Scientific America*, April 1967, 59).



Fig. 9. Stair: being tested by a member of the design team.

Notes

1. Henri Bergson, *Matter and Memory* (New York: Zone Books, 1988) 111-112.
2. Julio Cortázar, *Historia de cronopios y de famas*, "Instrucciones para subir una escalera" (Barcelona: Edhasa, 1992) 21-22. (Translated from Spanish original, Álvaro Malo).
3. Ibid
4. Ibid
5. Entelechy (Aristotle) (Gk., *entelecheia*, "being complete"). In Aristotle's philosophy, "entelechieis" are regarded as the regulators of orderly activity causing things to do that which is natural to them and to seek their specific natural ends or completion.
6. Julio Cortázar, *Historia de cronopios y de famas*, 21-22.
7. Ibid
8. Henri Bergson, *Matter and Memory*, 100.
9. Gilles Deleuze, *Spinoza: Practical Philosophy* (San Francisco: City Lights Books, 1988) 21.
10. Julio Cortázar, *Historia de cronopios y de famas*, 21-22.
11. Jean François Lyotard, *Peregrinations: Law, Form, Event*. (New York: Columbia U. Press, 1988) 18.
12. Julio Cortázar, *Historia de cronopios y de famas*, 21-22
13. Ibid
14. Henri Bergson, *Matter and Memory*, 173
15. Julio Cortázar, *Historia de cronopios y de famas*, 21-22
16. David Bohm, *On Creativity* (London: Routledge, 1998) 7.
17. Henri Bergson, *Matter and Memory*, 47
18. Gilles Deleuze, *Bergsonism*. Zone Books, New York, 1991, 59-70
19. Julio Cortázar, *Historia de cronopios y de famas*, 21-22