

Power Circles and Line of Forces

by Imre Kemecsey, Zoltan Varga and Earl Metzler

Introduction

"What is there to add or subtract from Imre's and Zoltan's work displayed below on the Power Circles and the Line of Forces? The Power Circle structure has been the innovative lifeblood of Imre's work; he has studied, perfected and chosen to share with us so we can become the best paddling athlete we can become.

Musicians have notes on a score, dancers a short hand list of choreographed steps; kayakers have the line of forces and the power circles. Motor skills, as discussed in a previous article, start where the muscles teach the brain to remember certain specialized movements, that then can be repeated using commands associated with that movement, "Pull", "flick", "release", etc.

With kayaking what specialized movements must the muscles master to teach the brain to encode these motions so they are easily repeatable without thinking, like dance steps? Here follows a list of lines of force associated with the PC's that are easily teachable in a progressive systematic process. Not only are these motions the basis of good paddling technique, they are the foundation and ground work. They are repeatable and measurable, to maximize efficiency in the body where it can go faster with less stress on the muscles and joints. Muscle memory teaches the brain; but the brain, through visualization, can initially guide the muscles to move in a prescribed way.

Kinesthesia by itself would be exemplified as learning to balance a K1. Here the brain learns a set of instructions where it can consciously put the body in positions one by one, followed by another. With the Lines of Forces, the muscles memorize positions as instructed by the brain's cognitive function and the brain can encode those actions - PC1, LF1, LF2. After practice these movements are then repeatable by remembering or visualizing the various 'codes'. The brain understands a 'g' minor scale, and instructs the fingers where to go, and by doing so the muscles tell the brain how the 'g' minor scale feels, so after practice, one no longer thinks about the process it just gets done.

Below you will find the guidelines that fuel visualization which then acts as a starting place to have the muscles move in a specialized way, which eventually teaches the brain to remember these movements. In scholarly study of kinesthetic movement, this would be a wonderful example of "pedagogic" methodology which aids coaches to teach and students to learn." -E.M.

Power Circles

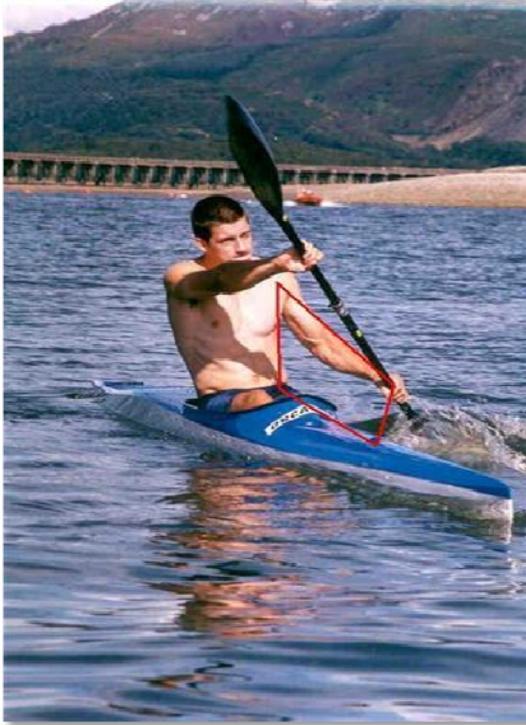
A Power Circle is considered a Framework or Template.

Usually the coach emphasizes one Power Circle and repeats the exercise on dry-land or on the water.

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Line of Forces (LF) in the Power Circles

Power Circle #1



LF #1

The blade of the paddle is fixed in the water. The LINE of FORCE starts from the footboard along the leg, into the gluteus muscles on the pulling side.

LF #2

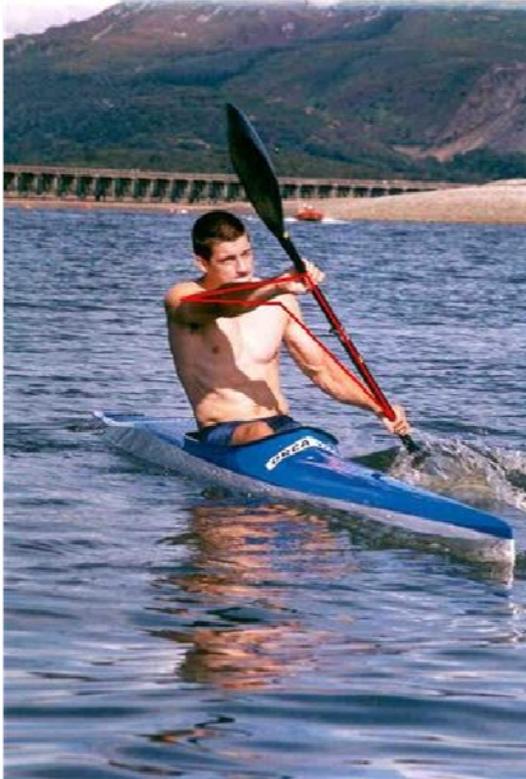
Starts from the gluteus muscles into the shoulder (deltoid muscles) on the pulling side

LF #3

Starts from the shoulder, along the arm into the hand on the pulling side -- from the hand into the footboard on the pulling side.

We note that the force direction and magnitude of the force, in addition to the timing of effort offers a special feed-back mechanism the athlete can then regulate.

Power Circle #2



LF#1

Starts from the hand of the pulling side, along the arm into the shoulder (deltoid) on the pulling side.

LF #2

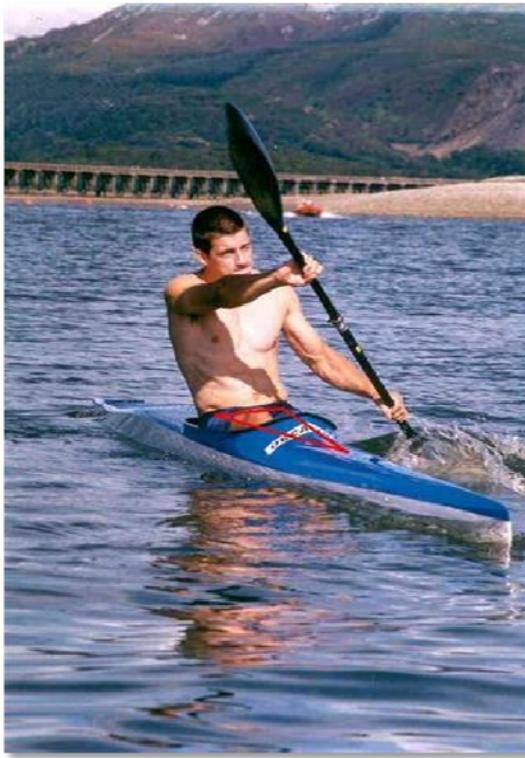
Starts from the shoulder (deltoid muscles) on the pulling side, into the shoulder (deltoid muscles) on the pushing (support) side of the shoulder (deltoid muscles)

LF #3

Starts from the shoulder (deltoid muscles) on the pushing (support) side. Along the arm into the hand on the pushing (support) side.

It is worth noting that the LINE of FORCES always travels as a straight line between two points, while the parts of the body, arms, legs are connected by the joints. Thus the Line of Force is the path the energy will flow through the body which then is the Power Circle.

Power Circle #3



LF #1

Starts from the footboard on the pulling side, along the leg into the gluteus muscles on the pulling side.

LF #2

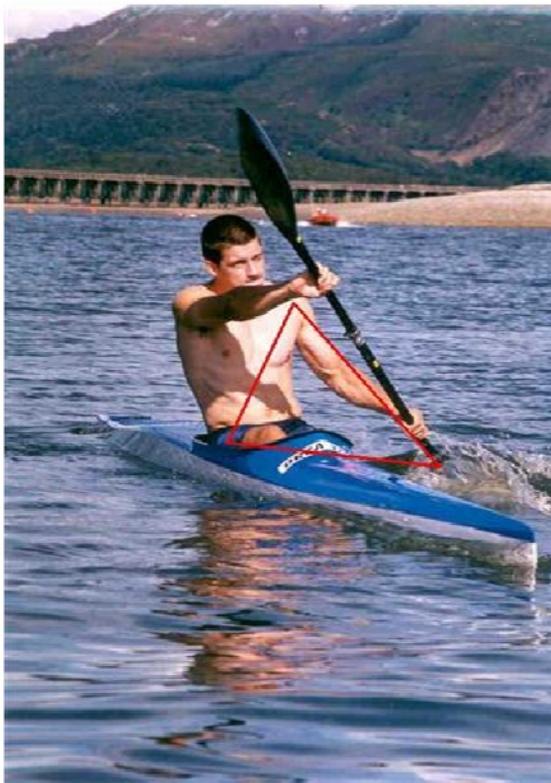
Starts from the gluteus muscles on the pulling side. Goes into the gluteus muscles on the pushing (support) side.

LF #3

Starts from the gluteus muscles on the pushing (support) side, along the leg into the footboard.

Spanish architect Santiago Calatrava is worth seeing wonderful works.

Power Circle #4



LF #1

Starts in the blade of the paddle on the pulling side, moving along the arm into the shoulder (deltoid muscles) on the pulling side

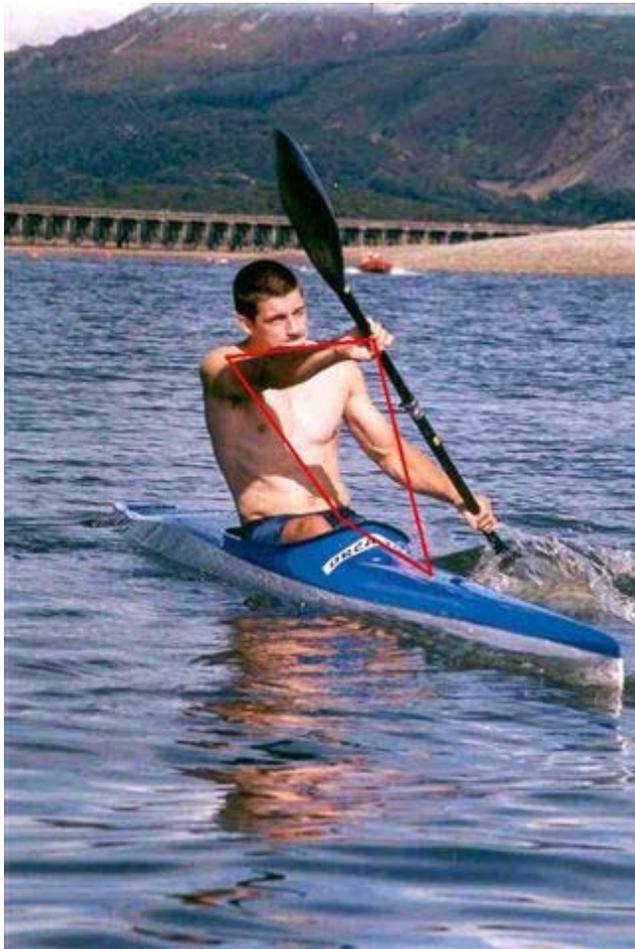
LF #2

Starts from the shoulder (deltoid muscles) on the pulling side, across the body (trunk) into the gluteus muscles on the pushing (support) side.

LF #3

Starts from the gluteus muscles on the pushing (support) side, into the blade of the paddle in the water.

Power Circle #5



LF #1

Starts from the footboard on the pulling side. Moving along the leg on the pulling side, into the gluteus muscles on the pulling side.

LF #2

Starts from the gluteus muscles on the pulling side, across the body (trunk) into the shoulder (deltoid muscles) on the pushing (support) side.

LF #3

Starts from the shoulder (deltoid muscles) on the pushing (support) side, moving along the arm into the hand on the pushing (support) side.

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