

Biomechanical Classification of Judo Throwing Techniques (Nage Waza)

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I) HISTORICAL SURVEY

The classification of standard Judo throwing techniques (Nage Waza) was born from the following didactic requirement — *To group the standard techniques under logical criteria for an easier understanding and useful systematic study.*

The two problems of Classification and Teaching arrangement were tackled and solved by dr. Kano (founder of Judo) and his assistants in a scientific way, according to the knowledge of their time.

The first classification of Nage Waza (1882) was carried out by a real proto-biomechanical method.

As a matter of fact, the standard techniques were classified by parts of Tori's (the attacker) body which work as greater contact-point for energy transfer in throwing.

From that we have the «Kodokan Classification»: *Te waza* = shoulder, arm and hand techniques; *Koshi waza* = hip techniques; *Ashi waza* = leg techniques; *Sutemi waza* = body-abandoning techniques or sacrifice techniques (Tab. 1).

This admirable classification is simple, intelligible and almost perfect. That is the reason of its long success even if it has some shades in itself; in

fact it is unusual to see hands, hips or legs of Tori working alone in throwing.

Besides the Kodokan classification uses a different way to classify the body-abandoning techniques, which are classified by the body side touching the mat: *Ma sutemi waza* and *Yoko sutemi waza*, body-abandoning techniques on his own back and on his own side.

In his golden book «My study of Judo» G. Koizumi classified the standard judo techniques by Uke's (the defender) body motion.

This study, performed as systematical analysis of Nage Waza, permits to group the standard techniques in three sets, according to the basis of the technical principles.

Namely the «Koizumi Classification»: *Kuruma waza* = wheel techniques.

Throws which are effected in such a way, that Uke's body is curled and turned as a wheel.

Tenbin waza = Scale techniques. Throws which are effected by tripping or propping Uke's body, as a scale while it is held as a pole.

Tsumazukase waza = Tripping techniques. Throws which are effected by tripping Uke's foot or leg, preventing it from moving to regain or maintain stability.

In recent years A. Geesink and G. R. Gleeson have synthesized other kinds of classification.

The former Dutch champion, in his work, emphasizes the dynamic role played by biodynamical chains, while the latter, English senior coach, surely the subtlest student of western judo ones, in his historical book «Judo for the West», makes a very clever classification based on his enormous theoretical and empirical knowledge.

This classification collects the throwing techniques under two groups; First-Class of «turning» Uke's body around an obstacle (hip, leg, etc.) — Second-Class of «striking» Uke's legs.

This historical survey through various classifications introduces the attempt to rationalize the matters in a scientific way, looking for the basic physical principles of Nage Waza.

TABLE 1

FIRST KODOKAN CLASSIFICATION (1885)

TE WAZA	KOSHI WAZA	ASHI WAZA
Uki waza	Uki goshi	Okuri ashi harai
Seoi nage	Harai goshi	Sasae tsurikomi ashi
Kata guruma	Tsuri komi goshi	Uchi mata
Tai otoshi	Koshi guruma	Hiza guruma
Obi otoshi	O goshi	O soto gari
Seoi otoshi	Ushiro goshi	De ashi harai
Uki otoshi	Hane goshi	Ko uchi gari
	Tsuri goshi	Ko soto gari
	Utsuri goshi	Harai tsurikomi ashi
		O uchi gari
		Yama arashi
		O soto guruma
		O soto otoshi
MA SUTEMI WAZA	YOKO SUTEMI WAZA	
Tomoe nage	Yoko gake	Uchi makikomi
Ura nage	Yoko guruma	Tani otoshi
Sumi kaeshi	Yoko otoshi	
Hikkikomi gaeshi	Daki wakare	
Tsuri otoshi	Yoko wakare	
Tawara gaeshi	Soto makikomi	

II) BIOMECHANICAL CLASSIFICATION

A biomechanical analysis of judo throwing techniques must be dealt with in the following steps: firstly by simplification and secondly by generalization.

As a simplification principle for the problem of classes of forces involved, at first we can use the differential method pointed out by dr. Kano: subdivision of the throwing movement in three steps 1^o *Tsukuri* (preparatory movements aimed at throwing out of balance Uke's body); 2^o *Kuzushi* (the final unbalancing action); and 3^o *Take* (execution of movements aimed at throwing), and later we analyse the motion of Uke's body cutting out *secondary forces*.

Then we generalize the classes of forces, putting out the inner physical principles of standard judo throwing techniques.

This method, applied to Nage Waza, is able to group 77 throwing techniques (40 Kodokan go-kyo and 37 others) under two dynamic principles.

