KINESIOLOGY - HUMAN MOVEMENT SCIENCE

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Keywords: kinesiology, human movement science, movement activity, movement coordination, sedentary lifestyle, hypokinesis, anthropokinesiology, interdisciplinary science, movements symmetrization, kinesthetic sensations, lazy movement, positive attitude, overweight, morbidly obese, lifeline of humanity, sport kinesiology

Contents:

Summary

Kinesiology variously called - 29 of its variants were established - has accompanied human life from its very inception. A name for it was long searched for, although a long time ago its definition appeared - science about movements and kinesiology. Recently, out of this extensive mosaic, a name appropriate to its core content has emerged of **anthropokinesiology**. **Its foundations, across centuries, were created by the most famous scholars**: **Aristotle, Plato, Socrates, Leonardo da Vinci, I. Siechenov, I. Pavlov, N. Bernstein.** This demonstrates both the validity, as well as the complexity of the science. **The science is universal and interdisciplinary.** Development of modern civilization to a large extent, freed man from physical labor. Lack of significant effort has led to a significant change in the lifestyle, and with it to the increasing *"lazy movement"* and to the sedentary lifestyle combined with watching television, computer games and internet. **Physical activity of man in the century between l864-1964 was reduced by 93%**. Man *"forgot about his genetic program"* and continued his eating habits as before, inappropriate to the needs, began to put on weight. Man began to work against his body needs by living a lifestyle conducive to the emergence of diseases of civilization: obesity, hypertension, blood, spinal deformity, flattened feet and more. For example, **in the U.S.A. more than 70% of the population is overweight or morbidly obese.** This negative pattern is followed by the societies of more and more countries

around the world. **In 2007, more than one and half a billion inhabitants of the globe were overweight. Therefore, the beginning of the XXI century was called the plague of morbid obesity. WHO** forecasts for the coming years are even more disturbing, i.e. an increase in the number of obese people up to 40%. In this context, the science about movement appears as a ***"lifeline of humanity."***

1. Introduction

The paradox of our times refers to the fact that the performance of certain professional activities requires an increasing level of movement efficiency, at the same time we observe a decreasing level of this ability among great part of the societies of many countries. Man, by creating the contemporary civilization which dispenses him from executing hard physical work, has neglected the fact that the high advancement of technical devices which help man in his everyday life at the same time require from him the manifestation of high level of various movement abilities, and particularly of the coordination ones. The ever increasing demands are observed nearly everywhere and in everyday-life and in every profession. More and more often the most desired abilities and features sought in a good employee are: speed and adequacy of reactions, ability of movements differentiation, space-time orientation, ability of adaptation to surrounding conditions, and most of all - movements precision. They all require an efficient functioning of the central nervous system. This system develops and improves thanks to the execution of exercises, that is – the varied movement activity of the man. Such kind of activity is avoided by the majority of inhabitants of our globe, and particularly of those parts of the globe which are not necessarily inhabited by the richest.

The results of some authors' research (Berg et al., 1994) **indicated a 93% decrease in the human movement activity in the years 1864-1964**. **The result was the reduction in the level of movement abilities, and with it the growing obesity of the increasing number of people of various ages affecting already 1600 million people worldwide**. According to forecasts by the World Health Organization experts, the number may increase by 40% in 2017 (Starosta, 2008, 2010). The growing contradiction of these two trends must sooner or later find a resolution. The solution, though, may be only one. Man should take up the challenge of his comprehensive movement development for the sake of keeping healthy, extended life expectancy, comfort of life as well as for the sake of professional successes.

2. Movement in Human Life

Movement is a biological need of every living organism. Human organism was genetically programmed for an active life style. Man, creating the contemporary civilization, seems to have forgotten about this fundamental principle. In spite of the needs of the organism man started to have a sedentary life style. He stopped listening to signals informing him about his own needs, including the necessity to move as a natural need of the body and at the same time the source of health. The homo sapiens of the contemporary times started acting against himself living a life style inappropriate for his organism. Movement deficit resulted - hypokinesis! This deficit together with other negative factors causes many civilization diseases (hypertension, overweight, vertebral

column deformation, flat feet etc.). Their accumulation brings about irreversible changes.

Each of us constructs our own life style and putting it to practice accordingly affects the health. Thus, as some said: "*Our health is in our hands*" (Oczko, XVI century; Lafontaine, 1801; Amosov, 1971). With our own actions we can influence the maintenance of health and even its improvement, but we can also cause our own diseases by choosing inappropriate life style. Our activity may also contribute to overcoming a disease faster. According to V. Coleman (1993) an organism can cure itself of 90% of all diseases without external help. The exhibited movement activity may largely contribute to it. It also may have an important influence in maintaining and strengthening health. The awareness of these facts may contribute to the intensification of movement activity in this field within Polish society. This becomes necessary in the face of increasing civilization hazards.

3. Movement and Accompanying Emotions

Movement is a universal phenomenon accompanying man and all living organisms from the beginning to the end of their lives. Hence, the very succinct but very emphatic words of the great ancient philosopher **Aristotle**: ***"Movement is life"*** become very current. Some authors (Fetz, 1972; Hartmann, Senf, 1997; Hartmann, Minow, 1999; Starosta, 2010) added a vital part to this genial premise: *"Movement is life and experiencing"*. Emotions accompany every movement, independently of whether they are carried out in everyday life, during trainings or competitions.

This is due to the fact that during movement stress hormones- adrenaline and cortisol, there is an increased reproach to the blood, whereas endorphins - *"happy hormones"* responsible for improving mood are secreted. Hence, not only the poet W. Goethe felt an increased creativity while walking, and the Nobel laureate- physiologist, I. Pavlov - preferred movement activity to mental. During competition, and therefore in extreme conditions and stress, these emotions reach the peak. Their intensity depends on the rank of the competition: the higher it is, the higher the emotions. The greatest excitement is accompanied when setting records: personal record of competitor, city, country, continent, world, Olympic Games, as well as when winning medals. These emotions are always positive, and combined with a great expression not only through *"body language"* and so facial expressions and gestures (e.g. *"W. Kozakiewicz's gesture"* made after winning the gold medal in pole vault at the Olympic Games in Moscow passed into history), but also expressions of movements of the entire body (i.e. the performing of the *"winning dance"* and acrobatic exercises). Extremely spontaneous and expressive emotions are seen in soccer players after scoring a goal in a prestigious match. Their level is increased after earning high financial rewards for winning the match and scoring goals. Negative emotions are accompanied when failing to perform exercises or after obtaining a lower than expected result. The execution of almost every exercise, both during training and especially during the competition is subject to evaluation - assessment by an athlete, by his coach and by the audience, and in incommensurable sports also by referees.

Experiencing is of different time dimension during a performance of short-term exercise. For example, during track and field throws, the athlete immediately after leaving the equipment off his hand – through a variety of *"body language"* - mimics, gestures, etc evaluates its quality when the equipment is still in the air. This evaluation is based on kinesthetic sensations *"movement feeling"* and *"equipment feeling".* Such *"rapid"* self-evaluation combined with the experiencing of sensation is characteristic of experienced athletes, (Starosta, 2011). The relationship between experiencing sensations and *"movement feeling"* was indicated long time ago by an eminent scholar - F. Fetz (1972). This feeling arises from *"body feeling"* and its sub elements are differentiated by the kinds associated with the specificity of various sports disciplines such as: *"water feeling"* in swimming, *"ball feeling"* in football and handball, etc. These feelings allow performance of precise movements, i.e. of high quality and this affects the level of technical masterships. The higher their level, the more significant are the sport achievements, and thus more positive are the emotions and the satisfaction accompanying them.

Less intense but more prolonged is the experiencing during movement activities of longer duration, such as skiing or track and field runs over long distances. This kind of effort is accompanied by more subdued emotions that require extremely high levels of speed endurance and coordination. For example, the well known Czechoslovakian athlete, long distance runner and marathon runner, a multiple Olympic champion, E. Zatopek ran with an unpleasant look on his face - *"grimace"*. However, it was difficult to expect any other manifestation of *"body language"* when he fought with *"himself"* to score the record. The learning process and the process of improving movement technique is combined with both positive as well as negative emotions of different intensity. The intensity is stronger when learning the techniques of new exercises. Emotions at different intensity accompany also the process of recalling a particular movement, even from a distant perspective. So far, few authors have drawn attention to this important element of the accompanying movement activity, which significantly affects the dependence on it. It would be extremely useful and worthy to promote human dependence on movement which, after all, arises from its genetic program.

4. Development of the Science of Kinesiology and Its Creators (Figure 1-6)

The science of human movement has been developing for many centuries. In this complex and creative process, eminent representatives of many scientific disciplines participated. The onset is combined with a galaxy of Greek philosophers. The father of this doctrine, some authors (Celikovsky et al., 1979) consider the great philosopher, Aristotle according to whom: *"... the source of knowledge are sensations called up by the impact of external objects on the sensory organs."* His views were based on observations and life experience (Zhukov et al., 1963). He was the first to describe the versatility of movement in man's life in a very synthetic form: "*Movement is life"*. K. Galen - physician of the gladiator school, determined the formation of movements due to tensions and contractions of muscles caused by impulses which run from the brain. He was the first to introduce concepts of muscle tone and muscle antagonist (Zhukov et al., 1963), and showed experimentally that the contraction is produced by the movement stimuli running along the nerve. The author of *"The Canon of Medicine"* Awicenn, applied movement exercises for medicinal purposes regarding them as a major factor in

maintaining health. He developed their classification, pointing to the specific properties and the need for individualization in their application (Zhukov et al., 1963). Leonardo da Vinci - was the first to attempt to resolve/analyze the human body to comply with the laws of mechanics. He was the creator of the science of body movement: he described human gait and drew attention to the coordination of limb movements. His *"Treatise"*, like other works in the course of three centuries, have not been published (Iwanicki, 1956, 22). G.A. Borelli - wrote the first book on biomechanics, "The locomotion of animals," in which he presented the classification of the locomotion movements of animals and human beings, and was the first to define the center of gravity of the body (Donski, 1963; Iwanicki, 1956; Meinel, 1967; Zhukov et al., 1963).

Figure1-6. Calendar of selected most important facts of human movement science development. Remarks: calendar has 6 parts (e-mail 3 in black-white version it is from cal1.tif- to cal6.tif.) when is to large, it can be smaller letter (capital) or made finish of the presentation on the text about N.A. Bernstein.

J.B. Lamark, the author of *"Philosophy of Zoology"* - showed the influence of exercise and environmental conditions on the development and shaping of body organs (Iwanicki, 1956, 24). C. Bell - discovered not only the muscle innervation by movement nerves, but also by sensory nerves. The latter provide connection with peripheral centers and allow for correction of centripetal impulses (Farfel, 1975, 5). The author of the work *"Nervous System of the Human Body"*. N. Dally - the author of the first book, *"Cinesiologie"* which includes the study of human movement and its relationship to education, hygiene and therapy (Renson, 1999). P.F. Leshaft - one of the pioneers of physical education and sport theory in Russia. In *"Fundamentals of natural gymnastics"*, he demonstrated the need to select exercises taking into account the structure and function of the body. The author of the *"Handbook of physical education of children at school age."* I.M. Siechenov - founder of the science of the functions of the brain and nervous system as a whole. For the first time he described the physiological mechanism of inhibition processes in the central nervous system. In the monograph *"Outline of man's working movements"*, he analyzed the complex working movements of the arms and legs. He was the creator of biomechanics of working movements. In his work *"Brain Reflexes"* he devoted much attention to the role of movement sensations in the steering of movements in time and space, as well as to the interaction of movement, visual and auditory sensations. Many of the ideas presented correspond to current knowledge (Farfel, 1975, 5-6). The works of the Nobel laureate, I. P. Pavlov contributed to the development of physiology, biology, medicine. Pavlov's concept of the whole body/organism, its unity with the surrounding environment, the theory of the first and second signaling system are the foundations of the theory of physical education and sport. N.A. Bernstein - has led to the integration of movement imaginations with neurological data, neuropsychological, and biomechanical study of locomotion movement. He was considered by some to be one of the greatest scholars of the brain of twentieth century. He published several monographs of fundamental importance to the science of movement: *"Basic science of human movement"*, *"On the building of movements"*, *"Outline of the physiology of movement and physiology of activity"*, *"On the agility and its development"*. He developed the principle of feedback and introduced the concept of sensory correction (Bernstein, 1990). This incomplete list of creators of kinesiology show that the vast majority of them came from Europe

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Bibliography

The bibliography has been completed from 33 positions of 30 authors in 6 languages (Czech, German, English, Russian, Swedish, Polish) published in the years 1801-2011. One was published in XVI century. The authors came from 10 countries: Croatia, Czechoslovakia, Belgium, Finland, France, German,

Poland, Russia, Sweden, USA. The material of this chapter was collected from 19 monographs and 14 articles.

[1] Amosov N. (1971). Wasze zdorowije w waszych rukach (Your health is in your hands). *Journal "Sputnik*", 6: 4-10. [Article about different kinds of conditions of human health with recommendation that "your health is in your hands'].

[2] Bartoluci M. (2005). University of Zagreb – Faculty of Kinesiology (3 edition). Zagreb, 1-36. [No scientific, but information article (handout) about the program of human movement science on Faculty kinesiology in Zagreb University].

[3] Berg M.A. et al. (1994). *Health behavior among adult population*. Spring 1993, Helsinki, National Public Health Institute. [On the basis of interesting investigation the team of professor Berg came to the conclusion that the physical activity in world population in years 1864-1964 reduce the level on 93%].

[4] Bernstein N.A. (1966). *Oczerki po fizjologii dviżenij i fizjologii aktivnosti* (An outline of movement physiology and activity physiology). Moskva, Izd. Medicina. [The world famous scientists N. Bernstein in this fundamental book write about movement physiology and activity physiology].

[5] Bernstein N.A. (1990). *Fizjołogia dwiżenij i fizjołogia aktivnosti* (Movement physiology and physiology of activity). Izd. Nauka, Moskwa. [A book about fundamental principles and conditions of movement physiology and physiology of human activity].

[6] Branting L.G. (1856). *Branting Lars Gabriel* (handwritten biography), Stockholm: Gymnastika Centralinstituts (GCI) enslylda arkiv: National Archives (RA) vol.6. [Contents of this work was a biography of Lars Gabriel Branting, one of precursors of human movement science in Sweden].

[7] Ćelikovsky S. et al. (1979). *Antropomotoryka* (Anthropomotorics). SPN, Praha. [A textbook of scientific basic human movement science – antropomotorics for students of faculty of physical education in Czechoslovakia].

[8] Coleman V. (1993). *Potęga ciała* (Power (might) of body). Wyd. Książka i Wiedza, Warszawa. [The content of the book is connected with possibilities of human body in different situations of life].

[9] Dally N. (1857). *Cinesiologie ou science du movement dans ses rapports avec l'education, l'hygiene et l'therapie*, Paris, Librairie centrals des Sciences. [First book in the world of human movement science – kinesiology connected with education, hygiene and therapie].

[10] Donski D. (1963). *Biomechanika ćwiczeń fizycznych* (Biomechanics of physical exercises). Wyd. Sport i Turystyka. Warszawa. [The textbook of biomechanics of physical exercises for students of Universities of Physical Educations in UdSSR].

[11] Farfel W.S. (1975). *Upravlenje dviżenjami v sportie* (Movements steering in sport). Izd. Fizkultura I Sport, Moskva. [Book about movements steering in exercises of physical education, sport and recreation].

[12] Fetz F. (1972). Zum Bewegungsgefuhl. [In:] *Bewegungslehre der Leibesubungen*. Limpert Verlag, Frankfurt am Main, 193-202. [About the feeling of movements (kinaesthesis) in the chapter of the book about movements learning in physical education].

[13] Gross H.H. (1975). Pedagogiczeskaja kinezjołogija – nowoje naprawlenije w sportiwnoj pedagogikie i biomechanikie (Pedagogical kinesiology – new direction in pedagogy and biomechanics). *Żurnał Tieorija i Praktika Fiziczeskoj Kultury*, 9. [Article for discussion about the pedagogical kinesiology as a new area of development in pedagogy and biomechanics].

[14] Hartmann Ch., Senf G. (1997). *Sport verstehen – Sport erleben, Teil 1*. Sportmotorische Grundlagen. Studienmaterial fur den Leistungskurs Sport an Gymnasien. Freistaad Sachsen, Staadsministerium fur Kultus. GmbH, Am Mart 16, 01561 Lampertswalde. [Basis of sport movements. The contents of this book is about the problem of sport understanding and sport to experience (feeling) as a material for study of German gymnasium scholars].

[15] Hartmann Ch, Minow H.J. (1999*). Sport verstehen – Sport erleben, Teil 2*. Trainingsmethodische Grundlagen. Studienmaterial fur den Leistungskurs Sport an Gymnasien. Freistaad Sachsen, Staadsministerium fur Kultus. GmbH, Am Mart 16, 01561 Lampertswalde. [Basis of training methods. The contents of this book is about the problem of sport understanding and sport to experience (feeling) as a material for study of German gymnasium scholars].

[16] Hoffman S.J, Harris JC (ed.) (2000). *Introduction to kinesiology. Studying physical activity*. Human Kinetics Publishers, Inc. Champaign, USA. .[In this great and interesting book is presented the many problems of the kinesiology, but without genesis of this new – old science and written only on material of West authors (USA, Canada) and without the authors from European countries].

[17] Iwanicki M.F. (1956). *Anatomia chelovieka.* (Human anatomie). Izd. Fizkultura i Sport, Moskva. [The Russian author in human anatomy presented some persons connected with development of human movement science].

[18] Lafontaine L. (1801). *Dziennik zdrowia* (Diary of health), 1801, 1. [Very long time ago the Polish author presented diary of human health with many important recommendation, some from which is actually in this day and age].

[19] Meinel K. (1967). *Motoryczność ludzka* (zarys teorii czynności sportowych i działań ruchowych z punktu widzenia pedagogicznego). (Human kinesiology – outline of theory of sports activities and movements activities from pedagogical point of view). Wyd. Sport i Turystyka, Warszawa, 1967. [Fundamental book translated from German to Polish about many important aspects of learning movement not only from pedagogical and historical point of view. Vademecum on many problems connected with movement technique learning and development. Important textbook for everyone connected with physical education, sport, recreation and rehabilitation].

[20] Milanović D., Custonja Z., Sporis G. (2008). Kinesiology in Europe and United States of America – differences in number and names of European and USA higher educational institutions. [In:] *Kinesiology research trends and Applications* (eds. D. Milanović, F. Prot). Faculty of Kinesiology, University of Zagreb, 24-29. [In this paper is presented the difference between the names of higher educational institution of European and USA. In USA and Canada is 145 universities with the name kinesiology and in European countries only three].

[21] Oczko W. (XVI century). *O różnych przypadłościach ciała ludzkiego* (About different indispositions of human body). [It was a very special monograph written by the doctor of Polish kings which as a first author in the world write about a important role of the movement activity in human life and his influence on health. He formulated a genial idea: *"Movement can replace almost every drug (medicine), but all drugs (medicines) together can't replace movement"*].

[22] Posse N. (1892). Modification of the Swedish system to meet American conditions. Physical education 1 (Oct.): 169-174. [The article about adaptation of the Swedish system of physical education to American conditions].

[23] Renson R. (1999). New insights into the biography and scientific background of Nicolas Dally (1795-1862), father of kinesiology (1877). Proceedings of Inter. Conference „Kinesiology for the 21st Century". Faculty of Physical Education University of Zagreb, 106-107. [Short article –abstract about the biography and scientific background of the father of kinesiology N. Dally].

[24] Renson R. (2008). From kinesiology to kinesiology 1854-2008: looking backwards to look forwards. [in:] Kinesiology research trends and applications (Eds. D. Milanović, F. Prot). Faculty of Kinesiology University of Zagreb, Croatia, p.80. [In the abstract of article is presented development of kinesiology in many European countries with the special position of author the first textbook of kinesiology of Dally].

[25] Starosta W. (2001). Science of human movement – meaning, name and direction of future development. [In:] *Acta Kinesiologiae Universitatis Tartuensis*, Vol.6 (supplement), 41-48. [It was a first probation of summary the contents of human movement science as interdisciplinary science, to find the right name of it].

[26] Starosta W. (2001a). Science of human movements – meaning, name, directions of development. *Journal of Human Kinetics*, Vol. 6: 3-22. [It was a next attempt to recapitulation the contents of human movement science as interdisciplinary science, to find the right name of its and the role in future of this science in human life, different kinds of activity, physical education and sport].

[27] Starosta W. (2002). Development of human movement science – meaning, history, name, connection with other sciences, organization, perspectives. *Journal Kinesiology*, (34), 1:222-233. [It was the next step of the summary of the contents of human movement science in historical, organization and perspective aspects].

[28] Starosta W. (2003*). Motor coordination abilities* (significance, structure, conditions, development). International Association of Sport Kinetics, Institute of Sport in Warsaw, Warsaw, 1-552. [It was a great monograph connected with most important element of human movement science – motor coordination, its significance, structure, condition, development and role in human life from birth to last moment of life. The great part of this monograph was connected with the kinesthesis and its role in sport technique learning and development].

[29] Starosta W. (2006). Ruch w życiu człowieka i jego znaczenie dla zdrowia (Movement in human life and its importance for health). *Roczniki Naukowe Wyższej Szkoły Wychowania Fizycznego i Turystyki w Supraślu*, 61-69. [Contents of this paper was presentation the role of the movement in human life and its importance for health with special exposition connected with the new trend in many countries of the world - overweight].

[30] Starosta W. (2007). Development of human movement science – meaning, history, name, connection with other sciences, organization, perspectives. [In:] *15th Anniversary of establishment and development of the International Association of Sport Kinetics* (ed. W. Starosta). Institute of Sport in Warsaw, University School of Physical Education in Poznan, Warsaw, 15-35. [In one part of this book human movement science from historical and organizational point of view in connection with other sciences and its perspectives of development is presented].

[31] Starosta W. (2010). *Human movement science – anthropokinesiology. International Association of Sport Kinetics*. Institute of Sport in Warsaw, University School of Physical Education and Tourism in Białystok. Warsaw. [In the many authors book is presented great number problems of human movement science and its connections with health, physical education, recreation and sport results. Great part of this book is connected with: Development of kinesiology in different European countries and USA; The importance of movement coordination, its structure and the hierarchy of intergrant elements in sport and physical education; Level of movement coordination in persons of different age with particular focus on the aging process; Role of kinesthetic sensations in teaching and improving sport techniques; Level of ball and opponent feeling, ist structure, conditions and shaping in opinion of advanced athletes; New concept of selection children for sport and development ist talent in many years training; Types and effect of movement adaptation a left-handed persons in daily life and contemporary sport training; Relationship between movement rhythm and respiration in physical education and sport; Muscles relaxation ability in physical education and sport; Concept of modern training in sport and many others problems].

[32] Starosta W. (2011). *Wybrane zagadnienia psychologii treningu i zawodów sportowych* (Selected problems of psychology in training and sport competitions). Międzynarodowe Stowarzyszenie Motoryki Sportowej. Wyższa Szkoła Wychowania Fizycznego i Turystyki w Białymstoku. Warszawa, 1-526. [In the new book connected with selected problems of psychology are presented from pedagogical view point: first in European countries the D. Uznadze theory of attitudes, their kinds and effects in everyday life and sport; mental training; components of self-education; psychological determinants of pedagogical evaluations of judges in different sports; components of individualization sport training; specific reasons for development of anxiety and ways of their elimination in highly advanced athletes; psychological preparation to competitions; planning psychological preparation].

[33] Zhukov E.K., Kotelnikova J.G., Siemionov D.A. (1963*). Biomechanika fiziczeskich uprażnienij*. (Biomechanic of physical exercises). Izd. Fizkultura i Sport, Moskva. [The textbook of biomechanics of physical exercises for students of Universities and Faculties of Physical Education].

Biographical Sketches

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Doctor honoris causa of Open International University for Complementary Medicines in Colombo (1996); **honorary member of**: International Academy of Integrative Anthropology (Russia), Academy of Science of Technological Cybernetics (Ukraine), International Academy of Gerontology (Russia), Polytechnical Academy (Belarus). Meritorious professor in Faculty of Kinesiology University of Zagreb (2009). Honor member of Society of Idokan Poland (2007).

Editorial Committee - board member: ◘ Journal of *"Human Kinetics"* (Poland); ◘ *"Biology of Sport"* (Poland); ◘ *"Anthropomotorics"* (Poland); ◘ *„Acta Kinesiologiae Universitatis Tartuensis"* (Estonia); ◘ *"Kinesiology"* (Croatia); ◘ *„Kinesiologia Slovenica"* (Slovenia); ◘ *„Studies in Physical Culture and Tourism*" (Poland); ◘ *"Sport Medicine"* (Poland); ◘ *"Acta Facultatis Educationis Physicae Universitatis Comenianae"* (Slovakia); ◘ *"Sport and Tourism"* (Poland); ◘ "*Ido movement for Culture"* (Poland); ◘ *"Acta Kinesiologica"* (Croatia); ◘ "*Ovidius University Annals"* (Romania); ◘ *"Podlaska Physical Culture"* (Poland); ◘ *"Physical Culture"* (Serbia); ◘ "*International of Sport Science and Fitness"* (India); ◘ *"Journal of Combat Sports and Martial Arts"* (Poland).

Publications: in total more than **800** different research publications **in 30 countries** of the world including **46 monographs - published in 5 languages:** "Symmetry and asymmetry of movement"; **"Psychological preparation in non-measurements sports"**; "Bewegungskoordination im Sport"; "Movement symmetry and asymmetry in sport training"; **"Bio-social conditions of sport training children and youth";** "Selected aspects of sport motorics"; "Motor co-ordination in sport and exercise"; **"Mental support of sportsmen".** "The importance, kinds and structure of the jumping ability and its determining factors"; "Movements kinesthetic differentiation ability and its conditions"; **"Motor co-ordination abilities"**; "Global and local motor coordination in physical education and sport"; **"Human movement science – anthropokinesiology";** "Selected problems of psychology of training and sport competitions"; **"Interdisciplinary conditions of sport training children and youth".**

Personal achievements in sport: was athletes in **20 sports**, in 12 was classified. The greatest achievements in **ice figure skating** (USSR Students Championship - 3 place in pair skating), **wrestling** (vice-champion of Leningrad) and ringo – Polish sport game (**19 medals** on International Polish, European and World Championships). **First-class coach** in ice figure skating – **practicing 20 years**, also as coach of national team of Finland, Poland and Sweden. His pupils successfully took part in Finland, Poland, Sweden, European and World Championships. In ringo his pupils won **38 medals on International Polish Championships, European and World Championships.**