

THE JOURNAL »KINESIOLOGY« IS THIRTY YEARS YOUNG (1971-2000) AND TEN YEARS OLD (1990-1999)

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Review

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Abstract:

Three anniversaries concerning the publication of the journal *Kinesiology* are addressed in the paper: (a) thirty years from the first issue publication in 1971, (b) since the Journal was revived in 1992, ten volumes (1990-1999) have appeared, and (c) the Journal was recognized as international in 1995. Certain bibliometric data, regarding the editing and publishing details, and the content reviews are presented.

Key words: kinesiology, journal, anniversaries, bibliometric data, content review

DIE ZEITSCHRIFT KINEZILOGIJA IST DREIßIG JAHRE JUNG (1971 - 2000) UND ZEHN JAHRE ALT (1990 - 1999)

Zusammenfassung:

Dieser Artikel befasst sich mit drei Jahrestagen bezüglich des Herausbringens von der Zeitschrift *Kineziologija*: a) dreißig Jahre seit der ersten Herausgabe im Jahre 1971, b) es wurden, seit der Wiederherausgabe im Jahre 1992, zehn Hefte (1990 - 1999) veröffentlicht, und c) die Zeitschrift wurde im Jahre 1995 als international anerkannt. Es wurden in diesem Artikel auch bestimmte bibliometrische Daten bezüglich des Edierens zusammen mit dem Überblick von Inhalten der bisher in der Zeitschrift veröffentlichten Artikel dargestellt.

Schlüsselwörter: Kinesologie, Zeitschrift, bibliometrische Daten, Inhaltsüberblick

Introduction

Thirty years in the life span of a journal may seem either a long or a short period of time, but it is undoubtedly a good moment to analyse the past and to outline the visions and prospects – the season of learning is behind us, now we are what we are and on our own to make what we can of ourselves. The comparison to a human life is hardly avoidable – thirty years in a person's life announce a period of maturity and a beginning of, usually, the most productive and creative period in one's professional domain. People involved in editing and publishing the journal *Kinesiology* sincerely hope this applies to their efforts as well. For a long time the language barriers were a limit to a more vivid cooperation with the world, so theoretical and research reports and professional papers published in the *Kinesiology* before 1996 were *a priori* imprisoned inside local borders. That period is behind us. After the period of 1996-1999, in which the English and the Croatian issues of the periodical were published simultaneously, from the 32nd volume (2000) the Journal has been published in the English language exclusively. Each paper has

been and will be provided with an extended summary in Croatian to comply with the needs of the domestic readers who are better acquainted with other languages than English.

In order to introduce ourselves more profoundly to the broader fellow community of kinesiologists worldwide, i.e. sport and exercise scientists, we have prepared a review on the thirty-year long life of the Journal that you are holding in your hands, dear Reader.

Scientific journals are still indispensable, although, according to some Internet-lovers, nowadays a somewhat obsolete means of communication for dissemination and exchange of information within an academic and professional environment(s), from the local to the global level. They are also a recognized means of assessing someone's scholarly work (the academic reward system - work efficiency, the rate, quality and quantity of publication, citation rate etc.). Therefore, each scientific domain and coherent research community tends to establish a journal as a forum for its concepts, research reports, inferences, and achievements, or, better to say, as a practical form of information channels which instigate, attract or dampen the circulation of knowledge

(Maričić, Sorokin and Papeš, 1992). This is almost essential for the, so called, "scientific periphery", in which the scientific communicability of a journal, especially towards the environment, is of the highest importance since it is generally self-understood that the fundamental process of science is communication. There is almost no point in doing research if researchers cannot tell other people what they have found.

Thirty years ago

It was in the late sixties that enthusiasts affiliated with the High School (College) of Physical Culture in Zagreb (established in 1959), particularly its Institute of kinesiology, conceived the idea of starting a journal for the scientific and professional issues regarding the field of kinesiological science.

Finally, the first number of the journal named *Kineziologija* (in English *Kinesiology*) was published in the autumn of 1971. The members of the Editorial Board were: the Editor-in-Chief Vladimir Horvat, associate editor Miloš Mraković, the secretary of the Editorial Board Krešimir Štuka, Miloje Gabrijević, Radovan Medved, Konstantin Momirović, Živko Radan, and Slavko Delfin. The Advisory Board, consisting of 20 experts and researchers mostly with the High School (College) of Physical Culture in Zagreb, was established, too. Two issues were announced for the next year, 1972.

The reasons for establishing the Journal and its mission were explained in the Editorial. Scientists and teachers dealing with kinesiological research, as well as with research into adjacent and/or cognate sciences, on the findings of which kinesiology is founded or is

related to, were not provided with any scientifically or professionally appropriate publishing options. Due to the limited opportunities for the circulation of information, the Editorial Board regarded that kinesiology had not been fully recognized as an independent science within the academic community at that time. To overcome these obstacles was the proclaimed mission of the first journal of such a kind in Croatia and former Yugoslavia. The publication of the periodical was granted by the Croatian Committee for Scientific Work. Fifteen contributions in the Croatian language were published, but each was provided with a title and abstract in English. Miloš Mraković prepared the opening paper which presented the principles, content and structure of kinesiology, developed by the scholars with the High School of Physical Culture in Zagreb.

The nineteen-year-long period (1971-1989)

Editing and publishing features

The Institute for kinesiology of the High School of Physical Culture (a member of the University of Zagreb since 1967), which was later renamed as the Faculty of Physical Culture in 1973, had been the publisher of the Journal from the beginning till volume 13, number 1-2, 1982, when the Yugoslav Society of Physical Education Teachers took over the role of publisher. Nevertheless, throughout the entire period the Editorial Board, editorship and administration was with the Faculty of Physical Education in Zagreb. The first information on circulation was presented in 1984 (volume 16, number 1) – it declared

The driving forces of publishing:

EDITOR-IN-CHIEF	EDITOR	SECRETARY	TECHNICAL EDITOR
Vladimir Horvat (1/1971 – 1-2/1978)	Miloš Mraković (1/1971 - 1-2/1978)	Krešimir Štuka (1/1971 - 1-2/1978)	Željko Pintar (1/1974 – 1-2/1978)
		Stjepan Heimer (1/1972 – 2/1983)	
		Smiljka Horga (2/1974 - 2/1983)	
Miloš Mraković (1-2/1979 – 2/1988)	Milan Blašković (1-2/1979, 1-2/1980, 1/1989)	Zoran Žugić (1-2/1979 – 1/1988)	Dubravko Hohnjec (1-2/1979 – 2/1986)
	Milutin Stojanović (1-2/1980 - 2/1989)	Vesna Pečnik (2/1988)	Goran Oreb (2/1987 – 2/1989)
Ankica Hošek- Momirović (1,2/1989)	Smiljka Horga - editor (1/1984 – 2/1989)	Zrinka Lučić (1,2/1989)	

In search of uniformity of scientific communicability - regular issues

Years	19
Volumes	21
Issues	29 (out of which 8 double issues)
Papers*	334
Editorials	7 – in Croatian only
Contents	- Croatian, English, and - Russian from 2/1972/2
Abstracts	- Croatian, English, and - Russian from 2/1972/1
Key words	- in English abstracts only from 15/1983/1 - in English and Croatian abstracts from 16/1984/1
Paper received datum	from 12/1981/1-2
Categorization of papers	from 15/1983/1
UDC	from 15/1983/1
Guidelines for authors	from 2/1972/1 irregularly – total of 13
Peer-review declared	from 16/1984/1
Running head	from 16/1984/1

*"A paper" is here meant to have a defined structure (an introduction, problem definition, method, results with interpretation, conclusion). Neither the non-documented reviews, news, conference reports, book reviews, anniversaries or obituaries were incorporated

Origin of papers, authorship and affiliations

Origin of papers		No.	%
(according to the	Faculty of PE	243	72.74
first author's	Domestic *	69	20.65
affiliation)	Foreign **	22	6.58
	TOTAL	334	100
Authorship			
	Single author	167	50.00
	Two authors	80	23.95
	Three authors	38	11.37
	Four authors	30	8.98
	Collective authorship	19	5.68
	TOTAL	334	100
Affiliation - all authors			
	Faculty of PE	496	74.81
	Domestic*	129	19.45
	Foreign**	38	5.73
	TOTAL	663	100

*"Domestic" refers here to papers written by authors affiliated with any Zagreb institution other than the Faculty of Physical Education, as well as with any other Croatian or Yugoslav institution.

** "Foreign" stands for the authorship from abroad.

an edition of 1,000 copies, which was the press run until 1989.

During the nineteen-year-long period six special issues were published besides the 29 regular ones, two of which were doctoral thesis, one was a scientific project and one was a publication of collected papers.

From the very beginning the practice of publishing papers with references, i.e. the pronounced orientation to proceed on the inferences presented in the literature of the predecessors, has been common in our Journal. It should be emphasized here because that characteristic distinguished the *Kinesiology* from the majority of the Croatian

Number of references

Number of papers	Total number of references	Mean	Referenceless papers
334	6243	18.69	9 (2.68 %)

social science journals, and especially journals that dealt with humanities, in the eighties (Maričić, Sorokin, Papeš, 1992). In the period from 1971 to 1989 only 9 (2.69 %) of the referenceless papers were published, although there were 20 papers with less than five references. Nevertheless, relatively a great average number of references should be assigned to several graduation, master of science and doctoral theses that were published, which contributed significantly to the number of references.

definition of the basic scientific principles and methodological orientation of kinesiology. Such papers were followed by the works of professors and assistants with the Faculty of PE (at that time the High School of Physical Culture), demonstrating rather a wide range of issues they were dealing with in the framework of either their qualification works (master of science or doctoral thesis) or scientific projects. The scope of interests ranged from determining the influence that versatile forms of exercising have on certain

Categorized papers - from 15 (1983) 2 to 21 (1989) 2

Paper category	Number	Percentage
Original scientific paper	119	84.39 %
Preliminary report	3	2.12 %
Review paper	4	2.80 %
Professional paper	15	10.63 %
TOTAL	141	100 %

Review of the paper contents and issues presented from 1971 until 1989

The aforementioned editing and publishing features, especially the affiliation of authors, revealed that the Journal was established primarily to be a forum for the kinesiologists with the Zagreb Faculty of PE. Only then came the researchers and professionals with other institutions from Zagreb, Croatia and former Yugoslavia to present their theoretical and research achievements. Therefore, the contents of the periodical reflected, to a major extent, the development of the kinesiological concepts and principles, kinesiological corpus of knowledge enlargement and its application that were conceived and elaborated first at the Institute of research in physical culture and later at the Faculty of PE. Certain orientations in contents, issues and interests are recognisable in articles published from 1971 until 1989.

The early beginnings of the Journal in 1971 and, partially, in 1972 focused on the

aspects of education, perceptions and attitudes of students, and bad body posture followed by the analyses of the movement structures in football, injuries that occurred during the PE classes and skiing, through demonstrating the isometric muscular strength measurement procedures and analysis of the maximum manifested strength of the attempted movements to the methodological works of which the most well known and frequently cited was the one on the total validity of variance as the fundamental criterion in determining the number of cardinal components. Sports recreation studies also appeared in that period and laid a foundation for the future numerous research projects. Two of them were later published in the special issues – *Sports (kinesiological) recreation: collected papers* (1975) and *Evaluation of the medically programmed active rests in relation to health improvement and life and work humanisation; Evaluation of the economic effects of sports recreation in development of tourism* (1984).

The next content-related period in the life of the Journal could be discerned already in the 1972 volume. Three groups of papers are recognisable. The first one was dedicated to the methodological issues (the number of significant factors in different solutions were determined as well as the taxonomic groups and relations between various factors obtained by different analyses). The second group of studies investigated the structure of the motor space. Authors dealt with the factorial structure of co-ordination, theoretical models of the motor structure, the differences between factors of power in students, all of which made a basis for the future research projects in the motor space. The third group of papers was related to the research on juvenile delinquency, comprising analyses of personality traits, perception and attitudes, and other psychological functions in young misbehavers, as well as the level of their resocialization in connection with their engagement in sport activities.

The aforementioned content orientation lasted till 1975. Papers with the methodological issues were not published often any more, but still there was one among them that was well known and often cited - a paper that presented a programme for the analysis of nominal and ordinal variables.

Two groups of papers dealt with issues related to motor behaviour. The first one addressed, generally, the reliability of all the tests employed till that time and, in particular, the metric characteristics of tests for assessing the different factors of co-ordination, flexibility and balance. The second group of papers focused on the structure of the entire motor space and on the relations between its particular parts, such as the relationship of co-ordination or flexibility and other motor abilities, or the energy regulation abilities and the movement regulation abilities.

Issues related to the research project on juvenile delinquency were relatively rarely published during that period, since the majority of them were more suitable for other periodicals (*Defektologija*, for example).

The first part of the 1976 double issue presented translations of works by A.H. Ismail, who was with the University Center Laffayette, USA. The late professor Ismail was a visiting professor at a postgraduate

study at the Faculty of PE at that time. The first paper was about his theory of integrated development, and the others were about the effects of exercise programmes on different psychological functions, and about the relationship between motor space, personal traits and cognitive abilities

A new orientation of investigation could be discerned already in the 1975 double issue and this period lasted till 1980. Papers dealing with analyses of anthropometric space started to appear alongside the continuous publishing of the motor space analyses papers. The former encompassed analyses of the anthropometric measurement reliability, structures of anthropometric measurements in different mathematical spaces, and the relations between groups of measures of different anthropometric dimensions.

Additionally, different types of analyses of sports activities *per se* were initiated, from the assessment of objectivity of refereeing in gymnastics and determining the factorial structure of the decathlon to the influence of certain anthropological characteristics on sport performance and achievements (the influence of flexibility and explosive power on the performance in the front crawl swimming, the morphological and motor characteristics on performance in certain athletic disciplines and others).

The 1979 double issue was dedicated to the invited conference lectures presented at the International Congress of AIESEP, held in Supetar on the island of Brač, 25-30 September, 1979. The invited conference papers addressed analyses of different parts of the anthropological space in relation to the motor abilities (structure of motor abilities, relations between morphological and motor abilities, biochemical foundation of personality traits, relations between cognitive and motor abilities, relations between personality traits and motor abilities, influence of social characteristics on motor abilities). They also presented analyses of the effects of the PE classes (PE teaching methods fundamentals, implementation of particular sport events in the PE teaching, active participation of students in the process of assessment and evaluation in PE).

Valuable graduation and master of science theses as well as parts of dissertations were

published throughout the observed period. Two complete doctoral theses were published in the special issues in 1974 and 1981.

In the period of 1981-1989 three groups of works can be distinguished. The first one is related to the scientific project "Influence of the specially programmed physical activity on psychosomatic characteristics, their biochemical foundation and on the efficacy of the process of resocialization". Papers were published in the special issue number 5 from 1982 and in the regular issue 2 from 1983. In the former publication the basic anthropological spaces were analysed, determined on a sample of the Faculty of PE students, as well as the reliability and the factorial structure of the situation-related motor tests in basketball, football, volleyball and handball. The number 2 (1983) was dedicated to the analyses of the relations between the basic anthropological spaces (anthropometric, motor, cognitive and conative) and successfulness (performance and achievements) in four sports game: basketball, football, volleyball and handball. These studies determined a model analysis of the sport specificity equation and became a foundation for the future investigations on the influence of various anthropological factors on the performance in a particular sport.

Several groups of papers are recognisable among the rest of the studies published during that period. First of all they were methodological papers, but they were not published any more after 1984. A continuation of the motor space analyses is visible, from analyses of the latent structures of the flexibility measures, over the co-ordination structure and metric characteristics of the flexibility tests analyses to the comprehensive analyses of the structure of all motor dimensions together.

The increasing number of works that could be included in the studies dealing with the sport specificity equation is noticeable. On both sides of the equations, the anthropological as well as the sport one, a wide variety of the analysed items appeared. Anthropometric measures were related to the running performance, conative factors to the high jump performance, basic aggressiveness to the full-contact karate performance, rhythmical abilities to the rhythmic gymnastics and dance performance, motor abilities to the karate techniques, body posture stability to the sport

shooting performance, anthropometric measures to the performance in karate, basketball and dance, motor factors to the learning of rowing technique, conative characteristics to the accuracy in volleyball, cognitive, conative and motor features to the wrestling performance, and many others.

A few papers were dedicated to the analysis of the very sport activity. The structure of the selected gymnastic technical elements was analysed, as well as the technical-tactical elements in volleyball, judging in male sports gymnastics was evaluated and a new approach to the configuration of the gymnastic elements was proposed.

Studies representing the findings on the influence of exercise programmes on different characteristics of participants (morphological and motor characteristics, perceptions and attitudes towards exercising) started to appear during this period. These were so called studies of treatment. We cannot resist saying that they appeared surprisingly late and in insufficient numbers in the life of the Journal, especially if we regard the importance of determination of effects of different exercise programmes.

Studies dealing with analyses of the micro-social sports groups occurred as well, mainly in volleyball and one in team handball.

One should notice the series of works about the structure of skeletal muscles, then the longitudinal studies on the following-up growth and development of girls and boys, and, particularly, reports from the sports genetics domain.

Analyses of the morphological space were continuously performed on different samples (women, men, students with the Faculty of PE, young athletes, top quality handball female players) with different issues in focus (structure, relations, changes during growth and development, the between gender differences).

Biomechanical studies started to appear (mathematical models of the horizontal and oblique trajectories – the flight of the body or an implement, improvements of the biomechanical model of the human body, removing interferences from the movement data, analysis of the body mass movement and inertia moments in gymnastics and others).

Publication number 2 from 1987 was dedicated to the series of research studies on

the relations between the various anthropological characteristics and engagement in sport, which were carried out on a large sample of men pertaining to the normal population. Cognitive and conative characteristics, social perceptions and attitudes, as well as the social environment were related to sports in these investigations.

Through the observed period a very small group of investigations was dedicated to the situation-related motor tests (in judo and wrestling) and to the analysis of sports activities and training (decathlon, basketball, other athletics disciplines).

Discontinuation in the regularity of publishing

In the late eighties problems appeared in communication within the former Yugoslavia area, hence problems in the organisation of publishing and submission of articles as a reflection of the growing antagonisms from the environment. Namely, the tendency in the editing policy since 1974 had been to encompass the entire Yugoslav research and scholarly communion engaged in kinesiology and cognate scientific fields. Due to the well known turbulent, growing political and macrosocial tensions at the end of the 80's and at the beginning of the 90's, the continuation of publishing the *Kinesiology* was suspended for almost three years. (The 21/1989/2 issue was hardly released on time, while the 1990 volume was not printed until the close of 1992). The people of the Republic of Croatia, a newly founded European state, were fighting for independence during the period of 1991-1995. Further historical explanations will reach beyond the boundaries of this paper, but it should be stressed here that those were hard war times even for the bare living, not to mention scientific and research work or publishing. The superseded organisational, political, and institutional forms collapsed and almost everything would have to be rebuilt again during and after the war. Fortunately, motivation was high and many spared no effort to give their contribution.

Ten years through ten volumes (1990-1995-1999)

Publishing resumed

During 1992 the members of the new Editorial Board, Editor-in-Chief Dragan Milanović, editor Vladimir Medved, members Milan Blašković, Dubravka Čiliga, Vladimir Findak, Radovan Medved, Mirko Relac, Viktor Šnajder, Nada Vođine[ajc, secretary Željko Pintar and technical editor Zdenko Jajčević, all being with the Faculty of PE, united their efforts to re-create and restore the publication of the *Kinesiology, Croatian* journal for the scientific and professional issues in the field of kinesiology. The joint publishing efforts of the Association of Physical Education Teachers of Croatia and the Faculty of Physical Education were financially supported by a Croatian Ministry of Science, Technology and Informatics grant. From the 27(1995)1 issue the Faculty of PE has been an exclusive publisher of the Journal, supported by the Croatian Ministry of Science and Technology and the Zagreb Sport Association.

A new editing concept was declared in the Editorial – it “acknowledges an interdisciplinary approach to the scientific and professional issues. The Journal welcomes papers dealing with issues regarding kinesiology, as well as other adjacent scientific fields, such as anthropology, methodology, biomedicine and other sciences, subjects of which correspond to the substance of kinesiology”. Its primary interest is to publish science (fundamental, applicable and developmental research reports), but highly applicable professional papers as well. The mission was to provide the conditions for the research work, publication and communication with the world, as well as to promote scientific orientation in the fields of physical education, sport, sports recreation and kinesiotherapy.

The attribute “Croatian”, which appeared in the subtitle of the Journal, meant no self-containment. On the contrary, all the members of the Editorial Board were aware that science knew no boundaries. A pursuit to comply with the requirements of a quality international journal was initiated simultaneously with the renewal of the *Kinesiology*. Esteemed international referees were asked to

The driving forces of publishing Kinesiology from 1992

EDITOR-IN-CHIEF	EDITORS	SECRETARY	TECHNICAL EDITOR
Dragan Milanović 1-2/1990 –	Vladimir Medved 1-2/1990, 1-2/1993 –	Željko Pintar (1-2/1990)	Zdenko Jajčević (1-2/1990 – 1/1996)
	Zoran Žugić 1-2/1991 –		Nada Vođine[a]c 1-2/1991 -
	Milan Čoh 2/1997 –	Renata Barić 1/2000 –	

participate in the process of reviewing, so the papers were submitted to the scrutiny of more strict international criteria. The policy of the obligatory international fellow evaluation (at least one of the referees should not be from Croatia) has been strictly implemented since 1994.

The membership of the Editorial Board has been greatly expanded since 1992. First, the sections were introduced (Sports, Education, Sports Recreation, Information Services) and section editors were appointed. Then, in 1995, the Editorial Board became international (13 Croatian and 9 foreign members) and today's sections were established. The foreign editorial membership is expanding - in 1999 there were 17 scholars from abroad. A fruitful meeting of most of the Editorial Board

members was held in Dubrovnik, in 1999, during the 2nd Conference on Kinesiology, where a lot of problems concerning the publishing of the Journal were addressed and certain directions for its future development were outlined. We wish to express our gratitude to the foreign members of the Editorial Board for their goodwill, time and efforts built into the *Kinesiology* enterprise.

The average number of references per paper has decreased a little in comparison to the previous period (12.74 vs. 18.69). The decrement should be assigned to the fact that no master of science nor doctoral theses have been published in the observed ten-year period.

Some bibliometric indicators - Kinesiology 1990-1999

Years	10
Volumes	10
Issues	25 (5 double issues)
Papers*	173
Editorials	13 – in Croatian and from 27/1995/1 in English, too
Contents	- Croatian and English
Abstracts	- Croatian, English, and - German from 23/1991/1-2
Key words	regularly
Paper received datum	regularly
Paper accepted datum	from 25/1993/1-2
Categorisation of papers	regularly
UDC	regularly
Guidelines for authors	regularly from 25/1993/1-2
Peer-review declared	clearly in Guidelines
Running head	regularly
Book reviews	18
Anniversaries, obituaries	10
Conference reports	15
Conference calendars	12
Bibliographies	9

*"A paper" is here meant to have a defined structure (an introduction, problem definition, method, results with interpretation, conclusion). Neither the non-documented reviews, news, conference and meeting reports, book reviews, anniversaries or obituaries were incorporated

Origin of papers, authorship and affiliations

Origin of papers	No.	%
(according to the	84	48,55
first author's	34	19,65
affiliation)	55	31,79
TOTAL	173	100
Authorship		
Single author	78	45,08
Two authors	43	24,85
Three authors	33	19,07
Four authors	8	4,62
Collective authorship	11	6,35
TOTAL	173	100
Affiliation - all authors		
Faculty of PE	177	49,03
Domestic*	60	16,62
Foreign**	124	34,34
TOTAL	361	100

*"Domestic" refers here to papers written by authors affiliated with any Zagreb or Croatian institution other than the Faculty of Physical Education.

** "Foreign" stands for the authorship from abroad (the states emerged from the former Yugoslavia included).

Number of references

Number of papers	Total number of references	Mean	Referenceless papers
173	2205	12.74	3 (1,73%)

Categorized papers

Paper category	Number	Percentage
Original scientific paper	124	71,76 %
Preliminary report	9	5,20 %
Review paper	13	7,51 %
Professional paper	25	14,45%
Invited conference paper	2	1,15 %
TOTAL	173	100 %

The edition of the double issue of the 22nd volume (1990) was 500 copies. In 1994 the press run was increased up to 750 copies. With exception of the two issues (27/1995/2 and 28/1996/1) the set circulation rate has been maintained up to today.

Graphical indicators also suggested turns in the editorial policy of the revived Journal. The

visual identity of the cover and internal arrangements were under the constant renewal and changes from the 1990 issue through to the number 2 of 1997, when, eventually, a new and variable, yet recognisable layout was created. Since then sport sketches made by the academic painter Anton Vrljić have been used for both the cover and inner pages design.

The Journal has been operating a system of the blind peer review (double-anonymous) from the beginning of the observed period, in which the authors' names and affiliations are withheld from the reviewers, acknowledged experts in the particular subject field. Here we wish to express our gratitude to several dozens of domestic and international referees, esteemed scholars from all over the world. Their more or less strict remarks and evaluations help the Journal to improve its quality. The process of reviewing and revising may sometimes take up to a year or even more. Although the authors are often impatient, thoroughness is indispensable to keep up with international competition and internationalisation, or, should we say, the globalisation of science.

A rejection of a submitted paper is an unpleasant fact each author has to learn to cope with. The most common reasons why manuscripts have not been accepted for publication include a flawed experimental design or a lack of originality, such that the work would not advance knowledge sufficiently to merit publication.

Content reviews across the sections

Members of the Editorial Board are convinced that the multidisciplinary and interdisciplinary nature of the Journal is a true reflection of the real problems (scientific issues) that exist in the world of sport and exercise.

Individual Sports and Activities

Three research areas are recognizable in the papers published in the journal *Kinesiology* 1990-1999. These are: the research of characteristics of a sport activity, the research of the dimensions of athletes and the analyses of performance factors.

Research of characteristics of a sport activity is comprised of structural, biomechanical and functional analyses which enable the determination of model characteristics in high performance sports. Likewise, this research enables the determination of correlations between the parameters of sport activities and performance.

Janković et al. (1991) analysed the basic characteristics of the elements of a top volleyball game. The efficiency of a set game

model of one top volleyball team to the existing efficiency model of a top volleyball team were compared.

Šentija (1991) analysed the relation between the duration of the actual playing time and the break in the final matches played by the best tennis players in the world. The lactic anaerobic metabolism is primarily activated in top tennis, and the basic role of the aerobic system was a quick regeneration of the exhausted anaerobic energy sources in the breaks between the points and during the change of ends.

Hofman and Žufar (1993) proposed a pole vault learning programme for schoolgirls.

Trninić et al. (1994) made a formal model for the kinematic description of the system "basketball game". The model recognized two basic states of the system: position and transition, and implied the ways in which to keep the balance. On the basis of the basketball regularities and the experience from the basketball game itself the system of principles for keeping the balance was presented, together with a list of the necessary rules which helped achieve this goal.

Zagorc (1996) classified 154 movement structures in aerobics, executed in the standing position and without any implements, into clusters. The fundamentals of the classification implied, on the one hand, the recruitment both of the cardiovascular system and of appropriate motor abilities, and on the other, the load imposed on the muscles and joints. The movement structures were divided into six rather homogeneous groups, and the research showed that the movement structures varied the most with regard to the involvement of the functional and motor abilities, and, above all, with regard to the topological load imposed on the muscles and joints of both the upper and of the lower extremities.

Grgantov et al. (1998) carried out a structural analysis of the elements of the volleyball game on the basis of some anthropological characteristics. By means of a hierarchical cluster analysis three clusters were obtained that were defined by the distance from which the ball was hit and the net.

Viitasalo (1999) researched the stability of the position of shooters of various abilities while shooting at a moving target.

Vuleta et al. (1999) researched the latent structure of the situation-, phase-, position-

and movement-related characteristics of the handball game. Five significant latent dimensions were obtained, but only three factors could be interpreted.

The research of the dimensions of athletes investigated the structure and the inter-relations of basic and specific dimensions of the athlete's fitness and the standard indicators of situation-related efficiency or performance.

Milanović (1990) determined the latent structure of fitness in 126 top female athletes. The fitness components in female heptathlons were interpreted by means of the factors of explosive power of both the relative and absolute type.

Ušaj (1991) analysed the competition results in cross-country skiing in 15 boys aged between 13 and 15 years. The competition results in cross-country skiing presented the criterion according to which the best combination of predictors, the results of the lowest possible number of track event tests, was selected, which then explained the largest portion of the variance of the criterion.

Šnajder (1991) carried out a comparative analysis of running over 100 metres on a sample of 110 PE students and the results from the 1972 Olympic Games in Munich. The final result of running over 100 metres in students primarily depended upon the level of their speed endurance, which was not the case in top sprinters.

Jerković (1991) determined the relations between 21 situation-related motor tests and the variable *techniques of the football game*. By means of the regression analysis a high and significant multiple correlation was obtained.

Žufar (1992) observed the development of results in 20 triple jumpers during a period of at least eight years and concluded that their results varied unexpectedly due to different factors.

Maksimović et al. (1993) constructed a new test for the assessment of the space and time orientation in wrestlers. The results of the metric standardization reported about its high authenticity.

Šnajder and Milanović (1995) found, after analysing the differences between twelve-year-old boys and top sprinters, as expected, that there existed big differences in favour of top sprinters in all elements.

Trninić et al. (1995) determined, with regard to the latent structure of the basketball game, and isolated, on the basis of standard indicators of performance, four relatively independent latent dimensions named: efficiency of the players of the rear defence line and of the front offence line, the efficiency of the players of the front defence line and the rear offence line, the general offence efficiency and the efficiency of goal throwing from a distance.

Trninić et al. (1995) determined the influence of offensive and defensive rebounds on the final score in a basketball game. The number of balls caught on defence appeared to be a more significant indicator of the final success in the basketball game than the number of rebounds on offence.

Pienaar and Spamer (1996) carried out research on a sample of 173 children in South Africa by means of a battery of suitable tests of skills and motor abilities, and found that the groups of deprived children showed certain weaknesses which should be addressed during the very development of talent.

Dežman (1996) showed a system which dealt with morphological, motor and playing status of young basketball players.

Milanović et al. (1996) presented the possibility of diagnosing functional and motor abilities as the criterion for the selection of national team basketball players.

Erčulj (1997) compared different criteria of efficiency and found that the absolute indices provided more data than the relative ones, because they were in a higher correlation with the evaluation of efficiency.

By means of the hierarchical cluster analysis applied on a sample of 70 basketball players within the space of 13 standard indicators of performance, Dizdar et al. (1997) obtained four homogeneous groups (types of players) defined as: outside players, specialist players, polyvalent players and inside players.

Swalgin (1998) presented the improved Basketball Evaluation System (BES) with regard to the positions of players in the game and the time played. Pondering (i.e. weights) additionally contributed to the nominal value of the model.

Jošt et al. (1998) followed the actual and potential successfulness in top ski jumpers by means of the decision system "Sport Expert".

Marelić et al. (1998) analysed the situation-parameters of top volleyball matches. The authors researched the influence of those elements on the outcome of a volleyball game. Large number of frequencies in descriptive statistics allows for making a model of the efficiency of executing each of the five elements.

Trninić et al. (1999) determined the differences between basketball players on different positions, on the basis of their height, weight and 13 standard indicators of performance. The results of the discriminant analysis showed that the anthropometric models differentiated between the players according to the positions they played, thus determining the tasks in the game which were reflected in the performance indicators.

By means of regression analysis and the "Tennis Expert System" Filipčič (1999) assessed the partial potential successfulness of a sample of 42 tennis players, aged between 12 and 14 years, in some selected areas of the psychosomatic status.

On a sample of 44 Slovenian cross-country skiers, aged 13 and 14 years, Pustovrh and Jošt (1999) assessed the competition successfulness by means of the sequential regression analysis and the expert model. A high degree of congruence of results in both procedures was obtained.

The analyses of the performance factors or of efficiency in a competition deal with a wide range of dimensions of athletes with regard to the competition efficiency as the basic goal of a sport activity.

Čaklec and Hraski (1990) carried out a quasi-regression analysis of correlation between 15 tests for the assessment of specific motor abilities and the result achieved at a competition in artistic gymnastics. On the basis of the obtained results significant relations between the applied battery of tests and the total score in a combined event, as well as with the marks in five competition events, were determined.

Tkalčić, S. and Tkalčić, D. (1990) determined the relations between the motor indicators and the evaluation of efficiency in executing a situation-related dynamic stereotype. On a sample of 115 female students of the Faculty of PE (Zagreb) it was determined that the results of 14 tests of the motor system could

not reliably explain one part of the efficiency of executing the analysed gymnastic element.

By means of regression analysis Marić (1990) determined a significant and high correlation between the criterion variables *victory*, *competitiveness* and *the speed of going into a bridge* and the predictor group of variables.

Kuleš et al. (1991) analysed the influence of running at different intensities on the efficiency in a football game. Three running intensities - low, medium to high, and maximal - were found to be significantly connected with the game efficiency, with the medium and high intensity running having the predominant influence.

On a sample of 27 top quality Croatian karatekas Kuleš and Muratagić (1993) applied eight specially constructed situation-related motor tests to determine their metric characteristics. Six tests (describing the space of specific coordination, speed, explosive strength and flexibility) showed satisfactory metric characteristics, while the tests of specific accuracy did not show any satisfactory characteristics.

Jerković and Barišić (1993) determined the relation between the situation-related motor variables, the accuracy of hitting the target, the ball control, the speed of dribbling the ball, the power of hitting the ball and the speed of zigzag running with the criterion of success in football, defined as the variables: offence and defence techniques, creativity, involvement in the game and responsibility.

Delija and Šimenc (1994) determined the contribution of motor ability (explosive strength) and of typical situation-related tests to the success in handball of 60 top handball players. The result of the regression analysis showed that the largest contribution was that of the explosive strength assessed by the *long jump from a standstill*, and, as far as the situation-related tests were concerned, *throwing the ball from a standstill* and *movement of a defender*.

Kuleš and Lucić (1994) carried out a research of correlation between situation-related motor tests in judo and the efficiency in a bout on the floor of 54 PE students. The regression analysis revealed a significant positive correlation.

Ivković (1995) determined the relation between situation-related motor tests of the speed of dribbling the ball and the evaluation

of the efficiency of play in football players. This evaluation was made by qualified independent observers. A significant canonical dimension was obtained.

Marić et al. (1996) carried out research on a sample of PE students concerning the relation between the anthropometric, motor and specific variables of technique with an actual wrestling bout. A significant positive correlation was obtained.

On a sample of 91 first Croatian Championship league handball games for women Brčić et al. (1997) checked the predictive value of the set of 43 technical-tactical variables for the assessment of elements executed in the play. The set of variables successfully discriminated between the games played by the teams of different quality categories and between the games played at home and away.

Physical Education

One of the very, if not the most, important domains of scientific kinesiological investigation refers to the areas of physical education. Physical education (PE) is comprehended as a process of learning, the context being mainly physical. The purpose of the process is to develop specific skills, knowledge and understanding and to promote a healthy way of living and physical competence. The focus is on the individual child and on the development of his or her desirable characteristics, abilities and knowledge, i.e. his or her physical competence, as well as on the positive attitudes to participate in physical activity. The latter is extremely important since it is well known that high levels of physical activity can contribute to health, growth and development, personal confidence and increased self-esteem. The eventual goal of PE is to provide the basis for a lifelong involvement in and enjoyment of physical activity and the ability to continue learning independently. It enables informed choice about the types of activities young people can become involved in for their own self-fulfilment and personal well-being.

Therefore, a considerable portion of the space in the Journal was dedicated to papers related to PE. Twenty three papers were published in the observed last ten volumes (22nd – 31st) within the section Physical Education – 12 original scientific papers, 3

preliminary communications, 7 professional papers and one conference paper. The majority of papers came from the Faculty of PE (13), two were written in Split, one in Osijek, and 7 papers came from abroad (England, Israel, Poland, Slovenia, and USA). A wide range of the issues is noticeable.

A strong interest in the inferences and findings of others is obvious from the bibliographic paper published in 1992. Vodinac and Radaković presented a selected bibliography of journals that publish texts related to the field of PE.

Several papers on the various aspects of sport and exercise participation of children and students, especially those dealing with the general structure of morphological characteristics and motor abilities, have been reviewed within other sections (Mraković and Katić, 1992; Medved R. et al., 1992; Delija and Mraković, 1993; Dvořakova, 1/1995; Hardman, 1/1997; De Knop et al., 1/1998; Mišigoj-Duraković et al., 2/1998; Miletić et al., 2/1998; and Horga and Štimac, 1/1999). The multi-disciplinary nature of kinesiological issues is additionally confirmed by the organisation of reviews in this paper.

Similar principles of teaching and learning apply for education in compulsory schooling and in sport schools, participation in which is the free choice of a child. In the early 90's several authors focused on organising and monitoring work in schools appertaining to numerous sports disciplines. Marić (1992) presented a model of a universal sport school, while Šnajder (1992) evaluated the work in certain Zagreb sport schools. Two investigations (Šnajder, 1990; Zagorac, 1990), carried out on a sample of the sport school participants, determined the relations between the basic and specific motor variables and sprint performance in girls and the relations between motor abilities and pole vault performance in boys, respectively.

Different sporting activities can contribute to learning in PE and this learning enables participation in sports. Three papers presented an implementation of the sport specific skills in PE teaching. Šadura (1992) advocated for the more frequent usage of trampoline, especially the mini one, in the education process, in particular for girls, while Marić (1993) proposed a modified type of wrestling for boys. Frankl (1/1996) carried out a

swimming and diving project for the youth in Los Angeles. The purpose of it was to introduce water safety principles, and to teach swimming and diving skills to children – the majority of whom came from low-income families – with the intent of enhancing self-esteem through the mastery of the mentioned skills.

During compulsory schooling students need a broad and balanced curriculum to meet their biotic needs for movement, which are not met in the modern age because spontaneous physical activities and the amount of moving being diminished. A well planned and balanced PE programme should ensure that students have the opportunity to take part in a wide range of activities, i.e. a range of tasks, contexts and environments so that individual's characteristics, abilities and skills can be adjusted, adapted, transformed and refined, improved. These environments help individuals to test themselves in a variety of competition situations, to compete against others and themselves, and, while overcoming difficulties, to recognise their own aptitudes and preferences. Due to their importance, PE curricula have been frequently subjected to the evaluation process, as can be seen in papers published in the *Kinesiology*. Puževski (1992) discussed the expansion of the circle of scientists studying the phenomenon of education. The most appealing feature of the kinesiological approach to education, the author states, is its orientation towards individual and human existence. Neljak (1992) proposed a contribution to a more precise definition of objectives of the teaching procedure. Cankar (2/1995) investigated pupils' motor efficiency from the aspect of a teacher's behaviour and his or her influence on the children from the sixth and seventh grade of elementary school. The pedagogical approach of the PE educator is an important factor of successful teaching. Findak et al. (1/1996) investigated the time rationalisation during PE pre-school classes and identified a series of objective and subjective problems related to the decreased effective working time, despite the fact that the pre-school PE curriculum is profoundly elaborated. Further assessment of the content value of the PE syllabus in the first four grades of elementary school was undertaken by Findak et al. (2/1997). The values were determined in relation to the transformation of important

anthropological characteristics and abilities. Osinski (2/1999) presented the current developments in the modernisation of the PE system in Polish schools, while Cheffers (2/1999) delineated the basic principles that should be followed in any future PE curricula designing.

Most papers published in the *Kinesiology* during the last ten years that directed their focus of interest on anthropological characteristics (anthropometric features, motor abilities and skills) of pupils and students have been presented within the section Kinesiological Anthropology. Here we should just mention the paper written by Mraković et al. (2/1996). The authors dealt with the developmental characteristics of the motor and functional abilities in Croatian primary and secondary school pupils. The research was the basis for establishing a national system of standards or norms.

The next group of papers dealt with motor learning and efficacy, as well as the effects of PE teaching, especially with the effects manifested in the transformations of anthropological characteristics. So, Blašković et al. (1993) compared two groups of 12-year-old boys: one group was engaged only in regular PE teaching, while the other participated also in an additional basketball programme three times a week. The influence of physical activity on the development of some motor abilities was investigated. Hraski and Živčić (1993) monitored and evaluated the motor efficiency manifested after a four-month exercise programme application. The majority of abilities was improved and physical fitness enhanced. Bonacin et al. (1/1995) investigated changes of the morphological and motor characteristics of boys attending the first grade of elementary school. The purpose of the paper was to study the efficiency of a six-month athletic programme, added to the regular PE classes. The efficacy of an experimental physical activity programme (aerobics exercise and selected folk and social dances), included in the regular PE classes, was an issue in the study carried out by Furjan-Mandić (1/1995). The experimental programme produced the homogenisation of the observed abilities.

The last, but by no means the least important, group of papers published from 1990 to 1999 encompasses research reports on students'

perception and attitudes to physical activity in general and to PE teaching, in particular. The attitudes towards exercise and physical activity in general and habits determine human behaviour later on in life, after compulsory schooling is over. Namely, they play a crucial role in decision making whether to lead a sedentary life style or to engage oneself in versatile, appropriate kinds of lifelong exercise and sport. Redžić (1992) investigated students' perception of PE classes at the Maritime Faculty, University of Rijeka, and Šumanović et al. (2/1996) accomplished the same on a sample of students from the Faculty of Economics in Osijek. The purpose of the both research studies was to perceive and respect students' preferences and needs in the future PE course planning and programming. Hagger et al. (2/1995) investigated children's attitudes towards physical activity by applying CATPA inventory and TRA (Theory of Reasoned Action) and FDR (Four by Day Recall) questionnaires. Fostering positive attitudes in children may have a positive influence on their physical activity levels at present and, particularly, in future. Štihec and Strel (1/1998) demonstrated the consequences of attitudes towards physical activity on the way primary and secondary school Slovenian students spend their summer holidays. Harel (2/1996) informed us on teachers' knowledge and attitudes towards health education (part of which is PE, too) and its teaching in Israel schools.

Recreation/Leisure

A unanimous agreement exists that regular physical activity is essential for optimal function of the human body, especially as a corrective to negative extrinsic factors, such as unappropriate diet, smoking, drinking, high work load, stress, sedentary life style, which are reflected in the morbidity and mortality statistics, especially in the elderly. Aging is obligatory associated with reduced fitness. Physical training can readily produce a profound improvement of functions essential for physical fitness, health enhancement and preservation and good quality of life in adults. Therefore, it is of no surprise that a lot of research findings have been published in the *Kinesiology*.

S. Tkalčić and D. Tkalčić (1992) researched the influence of a three-month-long kinesio-

logical treatment on some motor abilities on a sample of 50 retired women, aged 79 years on average. Measurements showed both the positive changes in the experimental group in comparison with the control group and the positive quantitative progress in comparison with the initial state of the examinees. This justified the application of continuous kinesiological treatments intended for the elderly.

Turner (1992) surveyed the relations between the consumers of sports-recreational programmes in West European countries and in Croatia. Although the sports-recreational programmes did not differ either according to the contents or quality, the number of participants in the developed countries showed to be significantly higher. The author proposed numerous explanations.

Artistic gymnastics belongs to the basic sports whose elements are applied in sports-recreational programmes. In his research into the influence of a recreational programme Dragičević (1993) included a group of gymnastics elements to verify the possible quantitative changes in some motor abilities of 42 women (20-30 and 30-40 years of age). The four-month kinesiological treatment significantly affected the global quantitative change of values of the motor abilities.

Professional work represents the area of permanent research from the point of view of kinesiological recreation. In order to decrease and to remove the acute fatigue which appears during the contemporary technological process, research into the influences of various recreational programmes provides the basis for creating the sports-recreational programmes, effects of which are measured by the working efficiency on the one hand, and the subjective feeling of well-being of the workers on the other. The issues regarding the ways of how to overcome chronic fatigue demand a complex approach and an insight into the initial health status as the criteria necessary to be met in order to model the appropriate kinesiological treatments.

Trkulja (1993) researched the influence of a medically programmed active rest (MPAR) on the recovery of 37 workers aged 30-39 years. The kinesiological treatment was conducted in the mountains and it lasted 10 days. The results of the canonical discriminant analysis showed quantitative changes in 12 motor variables.

Mišković (1994) presented the importance of applying the yoga programmes for the purpose of recreation. He discussed the possible adjustments of yoga programmes to various targets which primarily affect the strengthening of psychological abilities, but also the overcoming organic functional problems.

Andrijašević (1995) researched the efficiency of a 10-day medically programmed active rest on the transformation of some functional and anthropological characteristics in two groups of workers. The groups differed according to the type of occupational tasks set before them – 55 examinees drove farming machinery, and 55 were fitters, welders, mechanics, electricians, etc. The examinees underwent a uniform kinesiological treatment for the purpose of recovery and improvement of functional abilities. The analysis of multivariate procedures and the time effects of the treatment obtained by the analysis of quantitative changes (SSDIF) showed positive changes of various intensity.

Andrijašević and Bonacin (1997) researched the presence of subjective health problems in women, with regard to their chronological age and participation in a kinesiological activity. The analysis showed the already existing evidence about a better subjective perception of one's own health in those examinees who participated in sport-recreational activities on a regular basis. The research results showed the importance of accurate programming of a kinesiological activity. Apart from the objective indicators of anthropological characteristics and abilities, an insight into subjective health problems, as well as an insight into the entire health status are required.

Heimer and Relac (1998) presented a contemporary approach in the utilization of sports-recreational and sport activities during and after the rehabilitation of people with disabilities. Such programmes positively influence a whole series of psychophysical abilities and consequently the quality of life, which is, on the whole, a permanent task of kinesiological recreation.

On a sample of 158 patients suffering from pains in the back Vidmar (1999) researched the influence of sports-recreational programmes, as a supplement to the therapy in the standard medical treatment. Participation in sports-

recreational programmes accelerated the classical therapy, and the subjective feeling of well-being in patients increased.

Kinesiological Anthropology

Section Kinesiological anthropology in the journal *Kinesiology* covers several areas of kinesiology and cognate sciences and professions. These are: kinesiological sociology, kinesiological psychology, systematic kinesiology and methodology, kinesiological economics and kinesiological aspects of biological anthropology. True to say, kinesiological physiology, as well as sports and sports-recreational medicine should also find its place here. However, they find their place in other appropriate fields in this journal.

Kinesiological sociology deals with research and analysis of behaviour and the relations between active and passive participants in sports and in sports-recreation, as well as with the influence of sport on the perceptions and on the two-way relation between the way of life of particular groups and a particular population.

One of the especially interesting and socially significant topics is the one dealing with sport and collective behaviour, which implies the behaviour of some sport supporters, members of a particular subculture, and hooliganism, which is especially present in football. In the review article Žugić (1992) discusses the recent forms of collective behaviour of one of the subcultures of football supporters in the Republic of Croatia.

Šišak (1992) analysed the reflection of social and political changes in the former socialist countries on sport. The analysis of some determinants led to a conclusion that social changes do not affect all segments of sport to the same extent and that they do not distort its inherited structure.

Lalić (1993) analysed the ranges, the characteristics and the causes of the crisis in football game attendance and found two reasons for this occurrence: one reason implies the war conditions then in existence, and the other, a significant decrease of the quality of the football game in the First Croatian Football League.

Šimenc (1993) investigated the influence of homogeneity of the team, the quality and the age of water polo players on the success of the

whole team, and determined that all these characteristics significantly contributed to success.

Lučić and Viskiċ-Štalec (1994) analysed the sociological structure of basketball players belonging to two different generations, and they determined the taxonomy dimensions which differentiate between the players.

Doupona and Petroviċ (1997) discussed sport as a factor of the quality of life, and emphasized its humanistic principle, which is above sport utopianism and marketing-related pragmatism.

De Knop et al. (1998) researched the place, the role and the influence of the parents of children athletes, members of different sport clubs in the Netherlands.

Bednarik and Petroviċ (1998) investigated the possible influence of sport on spectators and their possible involvement in active sports recreation.

Trstenjak and Źugiċ (1999) analysed the components of the attraction of tennis and the ways in which these components affected the 'social involvement' on the basis of the sociocultural, psychosociological, institutional and kinesiological segments.

Kinesiological psychology is a part of applied psychology which deals with the psychological characteristics of participants in sport, their interpersonal relationships, kinesiological demands of sport directed towards the athlete's intellect and mind, and with the dynamics of changes of psychological characteristics and the state of mind under the influence of sport activities.

D. Milanović and M. Milanović (1992) analysed the influence both of a sport activity and of the environmental factors on the development of a child athlete. They determined that a sport activity, on the one hand, meets the needs of children, and, on the other, gives them an opportunity to express their creative potential. The environmental factors may significantly modify the influence of a basic sport activity.

Urli and Šikiċ (1993) offered an insight into the psychological characteristics of a child in sport with a purpose of protecting the integrity of a young active participant in sport. The authors emphasized the significance of the selection of an appropriate sport and the importance of a sports psychologist in sports-educational work for the success in training and at competitions.

Mejovšek et al. (1994) analysed the latent structure of the reactions to stressful and conditionally stressful events (air-raid sirens or similar stimuli). Anxious, conversive and dissociative characteristics prevail in these reactions, whereas aggressiveness is the least expressed.

Prizmiċ and Horga (1995) analysed the conative characteristics of judokas and younger gymnasts.

Horga and Štimac (1999) evaluated the motivational inventory scale which they constructed themselves. This scale was somewhat different for boys as compared to the one for girls. The scale was made to provide the answers to the question "Why do children exercise?". The scale structuring hypothesis was completely confirmed in all cases. The social and the extrinsic factor was identical for both sexes, whereas the intrinsic motivation in both groups was divided into similar, but still different factors.

Systematic kinesiology and methodology deal with the theoretical basics of application of kinesiological science and cognition, that is, they deal with the metrological and statistical procedures of the collection and the analysis of kinesiological data.

Mraković et al. (1993) worked out a theoretical model of classifying motor knowledge. They classified motor knowledge into biotic, general motor knowledge, professional and specific kinesiological knowledge. These types of knowledge were found to be connected, to have a certain hierarchy, to operate in congruence with the developmental age and to have a different transfer.

Neljak (1993) analysed in his preliminary communication the age-related conditioning of motor knowledge acquisition. He suggested taking into account the quantitative and the qualitative element of the selection of motor knowledge for a particular age category, together with some other anthropological characteristics.

Prot (1993) gave a survey of relations between motor knowledge on the one hand and human abilities and characteristics on the other, according to the concept of the 'Zagreb kinesiological circuit'. He emphasized the need to distinguish between the expressions motor-knowledge and general motor knowledgeableness. Simultaneously he suggested that motor knowledge-related

information bases be created in order to improve the informative support in this field.

Omrčen (1995) analysed the interaction between general and technical language used in sports, and consequently a significant transfer of the sport technical language into general language, especially the one of economics and marketing.

Findak and Mraković (1995) discussed the place and the role of physical activity in the addiction prevention. They emphasized the universality of this issue and the role of education in general, and particularly of physical education both in the primary and in the secondary prevention.

Blahuš (1996) discussed the modelling of latent variables of motor abilities as a recognizable case of the so-called "poor associative measurement". He compared the creating of the concept of motor abilities by applying the model with latent variables with parallel processes in classical physics, as a prototype of a well-developed scientific branch.

Gilbert and Johns (1996) presented the place of PE classes at American universities. They concluded that PE was expressed in a more strict didactic forms and that the students acquired almost 'military' knowledge. Simultaneously, the authors pointed to the loss of many important forms of higher education, such as accepting and carrying out a quality way of learning, and to the loss of the efficient reaction of teachers of organizational and behavioural sciences.

Hardman (1997) analysed the past, the present and the future influence of PE classes on the process of socialization. He expressed the fear that this part of the curriculum might lose one of its essential roles.

Starting from the general methodological postulate that the idea of a "research variable" is also inevitable in the qualitative research, Blahuš (1998) tried to methodologically support the so-called integrational approach as a unique and complete scientific strategy. In any case, to be meaningfully evaluated and interpreted, the qualitative data must be completely reliably recognized and accepted as the values of variables.

Omrčen (1998) analysed a significant number of TV sports commercials divided into two groups. The analysis of the types of

sentences used, the voice (active and passive) and the tenses on the one hand, and the choice of the figures of speech on the other, were found to be under a strong influence of the principle demanding clear and positive associations, which would consequently motivate the prospective consumers in their decision to buy the advertised product.

On the basis of some economic and some other indicators in particular regions in their country Bednarik et al. (1999) found that the development of sport is primarily the expression of the economic power of a particular region, and secondarily the expression of the age structure or of the degree of urbanization. It was concluded that the level of the development of sport in a particular region depends on the point of view of the local authorities which are in charge of the public investment resources.

Ambrožič (1999) analysed the relations between the anthropometric variables on four hypothetical morphological factors and he checked the suitability of the linear correlation model. The obtained results suggested that the linear correlation model was not completely satisfactory and that the non-linear factor analysis should be elaborated and verified.

Kinesiological economics and marketing become an increasingly important part of economic science and praxis. The research results and the application of the collected data in this field significantly influence the economic and social occurrences in sport, sports recreation and tourism in many countries.

Bartoluci (1992) points to the importance of marketing as a business activity directed towards optimally meeting the needs in all areas of physical culture. There also exists the need to educate the experts in sport marketing.

Bartoluci (1994) emphasized the significance of sport as a factor of economic development, which is realized through different types of entrepreneurship. Entrepreneurship should be developed in different sport programmes that are realized on the market, and consequently in complementary sport-related programmes in tourism, industry, handicrafts, etc.

Bartoluci (1997) analysed the data about the economic role of sport on the macro and on the micro level both in the developed countries and in Croatia. In the developed countries the

economic effects connected with sport exceed the ones in the transition countries to a great extent.

Stipetić and Bartoluci (1999) researched the prevalence of participation in sport activities in leisure time in some developed countries. Simultaneously, they analysed the different types of consumption in sport itself and in some complementary services. The conclusions drawn say that it is necessary to develop and to promote the economics of sport in order to increase the turnover and the profitability of investment.

Kinesiological aspects of biological anthropology deal with the structural, functional and motor characteristics connected with the effects of different types of physical activity during the period of growth, development and ageing of a human organism. The issues dealt with in this field are: the effects of general kinesiological transformational influences, and the effects of activities specific in particular sports.

Metikoš et al. (1990) researched the developmental characteristics of the general physical or motor ability in students, aged 11-18 years. The structure of this ability is constant across ages and sexes, but its influence on motor efficacy declines with age.

Marinović (1990) investigated the relation between the general motor abilities and conative characteristics with the success in performance on a rowing ergometer.

Kuleš (1990) analysed the influence of strength exercises of different duration on the speed and frequency of movements.

Mraković and Katić (1992) investigated the motor characteristics of the first form primary school male and female pupils. They found significant differences between boys and girls, especially in the values obtained for dynamogenetic and ergogenic abilities and coordination. They found an expressed endurance in boys, and an expressed flexibility in girls. By means of factor analysis they isolated four factors out of which two were identical for both sexes, whereas the two latent dimensions differed in boys and in girls.

R. Medved et al. (1992) analysed the morphological particularities of PE students and they found that, in comparison with their peers, they had a larger body mass, bigger circumferential dimensions of extremities and a significantly lower quantity of subcutaneous fatty tissue.

On the basis of 27 tests having different measurement objectives Delija and Mraković (1993) carried out a factor analysis of motor abilities in ten-year-old female pupils. They isolated five latent dimensions out of which the first one was an expressed representative of the general motor system and the others significantly poorly described the other motor abilities.

In children aged 5.5-6.5 years Dvořakova (1995) investigated the running endurance structure. She isolated four factors dominantly connected with the energy basis of an activity.

Delija et al. (1995) investigated the differences between the results of general and situation-related tests of motor abilities in pupils involved in handball training on the one hand and those who did not participate in any training regimen whatsoever. Statistically significant differences in all the observed tests were found in favour of the pupils who participated in handball training.

Wolf-Cvitak (1995) investigated the correlation between the level of motor ability and the twists executed in rhythmic gymnastics.

Prskalo (1996) investigated the differences in the amount of subcutaneous fatty tissue in girls aged between 12 and 15 years in comparison with their sexual maturation and war conditions in Sarajevo. In spite of the expressed stressful conditions, the biological age, that is, the level of sexual maturation, remained an expressed criterion for differentiating between the subsamples.

Kuleš (1996) researched the influence of anthropometric characteristics on the result in a judo bout in the absolute category in women.

Oreb and Kilibarda (1996) studied the significance of rhythmic abilities in dance. The results showed that, on the basis of the assessment of rhythmic abilities, the dance efficiency may be successfully anticipated.

Pinter (1996) analysed the flexibility structure in women on the basis of the direct measurement method (angular measures). For further study of flexibility the author recommends angular measures which are to a lesser extent saturated by the influence of the morphological body characteristics of the examinees.

Vuleta and Šimenc (1996) researched the canonical correlation between the mechanisms for energy regulation and the situation-related efficiency in handball.

Sertić and Vuleta (1997) researched, on a sample of eleven-year-old children, the correlation between the level of repetitive and explosive power with success in a judo bout.

Mišigoj-Duraković et al. (1998) investigated the morphological and functional characteristics of the student population at Zagreb University. They found a significant difference both in the morphological and in the functional characteristics between the PE students and their peers from other faculties.

In the review paper based on almost 600 references from literature, Sergienko (1999) found that the control of heredity is the most significant in the development of morphological characteristics of a human being. The genetic influence on the motor, functional and psychological characteristics is somewhat weaker. The author classified the prognostic value of morphological signs, as well as the motor and functional abilities for the selection in sport. The monitoring of the eco-sensitive characteristics was recommended for the assessment of fitness.

On a sample of top karatekas Kuleš and Marić (1999) investigated the correlation between the speed of simple movements and the success in a bout.

Training Methods

The fourteen papers published in the section Methods of Training belong to the fields of theory of sport training, sport training methodics and programming of sport training. Nine papers are categorized as the original scientific papers, whereas five of them are professional papers. Nine articles were written by the domestic authors. Three groups of issues are recognisable in the published studies: the sport preparation process modelling, analyses of the effects of the training methods and analyses of the effects of the programmed training in relation to certain sport preparation cycles.

The sport preparation process modelling is one of the basic areas of the kinesiology of sport, i. e. sports sciences. It deals with the designing and analysing of different sport

preparation models of the universal (comprehensive or universal sport school) and specific character (e.g., football, decathlon and volleyball).

Gabrijelić et al. (1991) defined the football game from the aspect of the tempo of play and investigated possibilities of designing and programming of the special endurance training of top football players.

Marić (1992) proposed in his professional paper a model of the universal children's sport school.

Milanović (1993) discussed four stages of structuring the sports preparation process in the athletic decathlon, which is extremely complex due to the nature of the event in question.

Marelić and Janković (1/1997) presented in their professional paper a contribution for developing the specific speed of movement without the ball in volleyball players. The authors suggested a remarkable number of exercises.

The analysis of the effects of the training methods employed deals with the effects of different exercise and teaching methods that are implemented in the sport training. A few papers on that issue were published in the observed ten years. The most frequently used variables in determining the effects were those for assessing the dynamogenic and ergogenic characteristics of examinees. Too little attention was directed to the experimental designs of teaching methods (methodics) and to establishing the actual relationship between the training implemented and changes obtained.

Heimer (1994) investigated the most important adaptation changes in muscle cells under the influence of a longer systematic power and strength training.

Škof (1/1995) investigated the influence of the cyclic monostructural activities on some biomechanical, metabolic and functional characteristics in athletes. Some quantitative characteristics of muscular fatigue and processes of muscular regeneration after two different specific workloads were analysed.

Ušaj (2/1995) researched the influence of endurance training on the results in the Conconi test in cross-country skiers.

Miletić et al. (2/1998) investigated the influence of initial status of motor abilities on motor learning in rhythmic sports gymnastics. A hundred of 11-year-old girls participated in testing and in a 6-month-long experimental programme. The most significant correlations to successful performance were recorded for the tests of flexibility, strength and co-ordination in rhythm. The test of legs movement frequency showed an outstanding predictive value for the compositions with the hand apparatus.

Hamar (2/1998) designed a simple computer based system in order to monitor force and power produced during weight exercises. The system provides on-line graphical and digital data and calculate mean and maximal values separately for the eccentric and concentric phase. The whole system allows the estimation of strength and power at different velocities as the basis for a more sport specific assessment of strength abilities.

The analysis of the effects of the programmed training is an area of the highest scientific interest due to the fact that results of these studies are directly applicable to the technology of preparation of athletes belonging to different quality classes in various sport events. Five papers are dealing with the effects of the programmed training in weightlifting, basketball and middle distance running. Tests aiming at the assessment of changes in the functional and motor abilities were employed. The findings obtained allow for conclusion that it is possible to detect and analyse the effects of training in relation to different cycles of sports preparation. It is recommendable for the future studies to include more variables for assessing the basic and specific abilities of athletes, and, which is more important, to present training programmes more profoundly.

Kuleš (1993) analysed the effects of a two-month-long training aimed at developing the absolute strength in weight lifters during the pre-competition period. Significant increases were recorded.

Milanović et al. (1994) researched the influence of a programmed training on changes of the motor abilities in 13 junior top basketball players.

Škof et al. (2/1996) proposed a model for the efficient monitoring of the training process in the middle and long distance running.

Jukić et al. (1/1998) tested the functional abilities of 15 junior top basketball players in

three points by means of a 7-test battery. Although the obtained differences were statistically significant in just one variable, remarkable improvements were registered in all given tests.

Željaskov (2/1998) defined top form in sports as a dynamic adaptive state of an individual. That variable status has a complex hierarchical structure and is regarded as an integral model of the preparedness (fitness) of an athlete to realise his or her own potential in sport performance. In almost twenty years the author analysed 7835 cases.

Sports Medicine and Sport Physiology

The journal *Kinesiology* published a relatively large number of papers from the field of sports medicine and sport physiology.

Kuleš and Košuta (1991) published a review article in which they tried to present the strain imposed on the knee joints in judokas.

Heimer, Medved and Hoffman (1992) measured the speed of the horizontal abduction of the dominant arm by means of an electronic device. They found that PE students performed these movements significantly faster than other students. The values obtained by male students were higher than those obtained by female students.

Šentija and Heimer (1993) measured the metabolic and ventilation parameters of top rowers at exhausting work on a rowing ergometer. The obtained results showed high values of the aerobic capacity. The high values of the aerobic capacity were in congruence with the results obtained by the rowers from other countries, which, taking into account the age (the average age of the rowers was 20 years), pointed to good perspectives for Croatian rowers.

Kosinac (1994) discussed the morphological and motor characteristics in girls, aged 11-13 years, suffering from various degrees of scoliosis. The author concluded that the growth in girls who suffered from scoliosis was more intensive during puberty.

Kapus et al. (1/1996) analysed the efficiency of swimmers on the basis of lactates. They found that it was possible to successfully assess the endurance within the structure of competitive performance, which was not the case with the speed endurance and tolerance to lactates.

In their review article Z. Duraković et al. (1996) listed the possible cardiovascular dangers that might occur during physical activity. They described the criteria necessary to reach a decision regarding the choice of people who should undergo a medical examination on the one hand, and on the other, the determination of an experimental load prior to participating in physical activity.

Mészáros et al. (1997) described the decrease of the plasma volume at maximal laboratory load in variously active men. The anthropometric measures, the body mass index and the subcutaneous fatty tissue were compared. The haematological analyses were carried out before and immediately after the load.

Jerolimov and Jagger (1997) described the orofacial injuries in water polo. The frequency of injuries was .57 per player annually. The injury rate was connected with the playing position of a player on a team. Out of the reported injuries, 96% occurred to the orofacial area. The most frequent injuries were cuts to the lips (48%).

Ratkevičius et al. (1997) described the contractile properties of a twitching quadriceps in athletes. The objective of this paper was to investigate the contractile properties of a twitching muscle in experienced sprinters (SR), rowers (AR) and cyclists (RC) in comparison with the control group of the same age (CO). Knee extension torque was recorded during electrical stimulation of the quadriceps by single stimuli, before and after the maximal voluntary contraction (MVC) lasting 10 seconds. The authors concluded that the sports specialization of each athlete affects the contractile properties at a twitch.

Kosinac and Marinović (1997) described the paramorphic and dysmorphic changes in top rowers. The research was done on a sample of 61 rowers (30 juniors and 31 seniors). The authors concluded the following: senior rowers were characterized by a higher percentage of indicators describing the correct posture of the body; in junior rowers a more and more frequent presence of spinal paramorphisms was obvious; the results of the analysis of variance showed significant difference in only two parameters: kyphotic posture and *pectus carinatus*; no regular influence of any type of rowing on the occurrence of spinal paramorphism and

dysmorphism was determined; the spine of rowers during the developmental age should be functionally prepared and protected against any possible overloads and stress.

Vest (1997) described the universality of reduced models of energy characteristics in kayak slalom. The author used five indicators of energy characteristics together with the best achieved time as an indicator of the competition result made. The basic finding here for the theory of training was that the best achieved time in kayak slalom competitions might be simulated by the time in a figure-of-eight paddling test, and that the competitive capability could be monitored under controlled conditions.

Luigi et al. (1998) described the injuries in the Olympic taekwondo on a sample of the young (n=139 male, n=43 female) and on a sample of the adult (n=102 male, n=24 female) taekwondo fighters. The main type of injury, regardless of sex, was contusion, and the most frequently injured parts of the body were feet and jaws. The main injury mechanism was delivering a round kick and receiving a round kick. The authors recommended bandaging the feet during competition.

Kiss (1999) described the relationship between the lactate and the Conconi anaerobic threshold in field tests. The objective was to analyse the relationship between the two field tests, both with a progressive load, one of them determining the amount of lactates and the other determining the deflection of the point of the heart rate. The research was conducted on a group of 12 triathlons. In both cases similar results were obtained – there were no statistically significant differences. The heart rate in both thresholds approached 170 beats per minute.

Z. Duraković et al. (1999) described sudden sports ground deaths which were not the result of a trauma. He presented the data about eleven men who died during or immediately after physical exercise in the Zagreb area during the period between 1973 and 1998. In all cases the thickening of the left ventricle was found (15-25 mm). It seems that the thickness of the left ventricle in persons without any apparent health problems increases the risk of cardiovascular complications during exercise.

Boyadjiev and Tarlov (1999) researched the regimen of the electrolyte concentration in young sportsmen. The research was carried out on a group of 845 highly trained pubescent athletes. The authors concluded that an intensive long-term sports training during puberty affected the serum homeostasis of the electrolytes.

J. Jurimae, T. Jurimae and Pihl (1999) researched the efficiency of work on the rowing ergometer on the one hand, and on the other, the anaerobic capacity in student rowers. Ten rowers underwent a 6-minute test on the rowing ergometer. The individual work capacity of the rowers was calculated according to the maximal heart rate during a maximal 6-minute test. The anaerobic threshold indices were determined by interpreting the relation between the LA concentration and the appropriate variable at LA concentration of 4.0 mmol/l⁻¹. The authors determined a significant correlation ($p < 0.05$) between the anaerobic threshold (W) and power ($r = 0.56$) and the distance covered ($r = 0.55$) during a 6-minute maximal test. They concluded that the research results pointed to the fact that the suggested interval test had its diagnostic value in the evaluation of the work capacity in rowers.

Biomechanics

During the period between 1990 and 1999 thirteen papers belonging predominantly to the field of biomechanics were published in our Journal. One of these papers (Mejovšek, 1994: Kinematic signals) belongs to the group of professional papers, whereas the other papers are scientific papers. The first subgroup is comprised of scientific papers dealing with the analysis of kinematic locomotion values. These papers are as follows: Čoh (1993) – athletics, Jošt (1994) – ski flying, Milanović et al. (1996) – athletics, Jošt et al. (1997) – ski flying and D'Amico et al. (1997) – posture pathology. Therefore, it may be concluded that sports biomechanics, which was researched on the basis of the situation-related measurements carried out on the field, was dominant. The only laboratory-related paper (D'Amico et al., 1997) was directed towards monitoring the kinematics of the spine. In this paper the authors presented a specially developed procedure for extracting various clinical parameters and for a complete

3-D description of the posture and the shape of the spine by using the new non-ionizing technique. The other papers belonging to this subgroup are characterized by a more simple measurement methodology and by the analyses of kinematic values. They are directed towards the actual application and present the contemporary examples of the applied kinesiological research. The second subgroup of scientific papers is comprised of papers that analyse the dynamics (kinetics) of movement, often simultaneously with kinematics: Mejovšek (1990) - biomechanical body model, Terze and Muftić (1995) – rotational movement of a human body, Čoh et al. (1995) - athletics, Čoh and Dolenc (1996) - athletics, Kuleš and Mejovšek (1997) – karate, and finally Kugovnik et al. (1999) - swimming. Mejovšek (1990) reported on the original biomechanical model of a human body, based on the inverse dynamic approach, especially adapted to sport-related locomotion. Kuleš and Mejovšek (1997) successfully combined kinematic and kinetic (reaction force of the surface) measurement values in the research of brisk and skilled movements in karate. Kugovnik et al. (1998) are the only authors who, within the group of biomechanical papers, experimentally research one of the water sports - swimming. Finally, one paper (Šugman et al., 1996), directed towards the analysis of the start technique in track events, uses the descriptive biomechanical methodology. Most papers deal with the issues of sport-related locomotion. Taking into account the interdisciplinarity of the field, it is interesting to emphasize that the first authors of the three papers, out of the thirteen listed, are non-kinesiologists (a mechanical engineer, an electrical engineer and a mathematics engineer), whereas the authors of all the other papers are kinesiologists.

A relatively small number of papers within the field of biomechanics is probably the result of a complex and demanding measurement technology and data processing in comparison with other fields. All the papers are characterized by a correct experimental methodology and it may be said that they meet the high standards of applied kinesiological research. Methodologically, the most complex papers are those written by Terze and Muftić (1994) and D'Amico et al. (1997) who used an expensive modern 3-D kinematic measuring

system ELITE, which was made in Italy. The quality of this paper is the closest to the usual level of papers published in CC journals in this field (Journal of Applied Biomechanics, Medicine & Science in Sports & Exercises, Human Movement Science). However, there is a shortage of electromyography-based papers. As many as six papers published were written by our colleagues from Slovenia, and one was written in co-operation between one Croatian and one Italian author (D'Amico et al., 1997).

Sports History

Only one, strictly historical, paper was published in number 2 in 1995. It presented a development of olympism in Croatia in the period between 1894 and 1912. Numerous historical themes regarding sport and PE in Croatia are published in the specialised journal *Povijest hrvatskog športa*.

Closing remarks

The Journal has undoubtedly reached certain standards of the content quality (Gleeson, 1997) and scientific communicability (blind peer-reviewing, the body of national and international referees, publishing exclusively in one of the world languages, the international editorial board, the regularity of publishing – twice a year: in June and December, abstracts in English, German and Croatian, the categorisation of papers, referencing and abstracting in bibliographies and/or signal publications and data bases – since 1990, and others). Therefore, the Croatian Ministry of Science and Technology recognised *Kinesiology* in 1995 as an international scientific journal.

Each issue contains 8 – 10 scientific and professional papers on 70 – 100 pages and Guidelines for Authors. The Harvard reference system is applied in the periodical, using the *Publication Manual of the American Psychological Association*, 3rd edition.

The topics cover a wide range of issues representing the multidisciplinary nature of kinesiology (i.e. sport and exercise science; Bartlett, 1998): research reports in the field of physical education, structural and biomechanical analysis of sports and sport achievements, topics from sports medicine,

sociology and psychology of physical education, sports, recreation and kinesiotherapy, biochemical and biomechanical diagnostics, modelling of transformational processes (exercise and training programme designs), the analysis of training effects, the economics and management of sport, sports recreation, general anthropological (regarding both the biological and cultural) topics and the history of sport.

Conclusion

Since the language barriers are no more a limit to a more vivid co-operation with the world, we expect an increased response from the broader fellow community, which might be less, acquainted with the Journal. Therefore, we have taken the liberty to present a review of 32 volumes and 50 issues of the *Kinesiology*. It covers a wide scope of scientific interests and research findings in the growing area of kinesiology. The emphasis is on the broadly defined human sciences applied to physical education, sport and exercise.

We also wished to draw attention to the fact that the concept of kinesiology (comparable to the concepts of human kinetics, or kinanthropometry, or sport and exercise sciences) had been conceived and defined as far back as in the late 60's in Croatia. From the late 80's we have been witnessing the occurrence and growing acceptance of the similar notion of kinesiology in the USA as well. The floor is open for discussion and the *Kinesiology* may play a crucial role in it.

Therefore, here we should draw into focus one of the conclusions reached at the Editorial Board meeting in Dubrovnik, back in 1999, that it would be of the highest importance to achieve real international recognition (which could be measured by the impact factor). It brings forth certain issues that should be treated as soon as possible, such as the improvement of the organisation of the Journal (first of all establishing the Advisory Board), then the quality development and evaluation (impact factor, already mentioned, and criteria applied for the Current Contents inclusion), as well as different forms of publishing (availability in print and/or online).

It will be a challenge to the authors, members of the Editorial Board, referees and executives alike to accomplish that the Journal brings relevant scientific findings and, at the same time, to achieve a level comparable to the well-established world journals. It requires hard work from the Journal executives, but it will be a senseless exertion if there would be faint response from the authors, Croatian as well as the foreign ones. The members of the Editorial Board are determined to, at least, preserve the multifaceted profile of the Journal and standards of quality already achieved. That means each quality enough paper, concerning research, inferences, detecting lawfulness, modelling, and

application of research results in the fields of physical education, competitive sports, in "sport for all" or sports recreation, adapted physical activity, kinesitherapy, without regard to the approach used (the monodisciplinary, multidisciplinary, or interdisciplinary one) will find its place between the cover of the *Kinesiology*.

The Journal is young enough to strive and work for a higher level of quality and appreciation, and mature enough to know how to accomplish that.

Dear Reader, you are welcome to join us in the search for the new frontiers in kinesiology and beyond!

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