

## APPENDIX

- 1: Musicians' hands – statistic results
- 2: Ranking of the coefficients of variation
- 3: Intra-individual variation of the hand
- 4: Childrens' hands – statistic results
- 5: The technique of hand investigation

Register of sources, illustrations and literature

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Illustrations of anatomy

Form for hand investigation and 8 sheets for hand measurement

**Hand und Instrument** contains the first and worldwide unique documentation of instrument-specific data of the musician's hand. Strong inter-individual differences, of which the extent was largely unknown till now, become apparent here. **Hand und Instrument** makes clear, which consequences can result for learning an instrument and a possible later career.

Manual advantages and limitations for playing an instrument become apparent in a "hand profile". It makes technical difficulties understandable, but also physical complaints of the individual musician and at the same time it makes possible to prevent manual overuse well-aimed. Thus, it can become the key to individual technique.

Every reader can make an individual hand evaluation on his own. It is easy to learn, takes little time and doesn't need any apparative aids. Instructions and measuring sheets are attached to the book.

The book explains the manual requirements of the different instruments as well as the biological backgrounds, as far as they are worth knowing for playing an instrument.

**Hand und Instrument** was developed through co-operation with musicians. The individual chapters are understandable independently of each other, but connected by numerous cross-references. Special expertise is not presupposed.

The book turns in principal to everyone playing an instrument, amateur or professional, above all, however, to the instrumental pedagogues from beginner lessons to university level. At the same time, it addresses instrument makers, physicians, physiotherapists and psychotherapists in the field of musician's medicine, Feldenkrais-, Alexander-, Eutony-teachers etc.

# Klavier

# Spannweite 1-5

Männer: Anzahl rechts 111, links 110

Frauen: Anzahl rechts 105, links 104

		MÄNNER	FRAUEN
Arithmetisches Mittel (mm)	R	226,7	207,4
	L	228,9	206,6
Variationskoeffizient (%)	R	5,0	5,5
	L	4,7	5,4
Minimum - Maximum (mm)	R	201 - 260	178 - 237
	L	199 - 252	184 - 235

## Dezile MÄNNER (mm)

	D1	D2	D3	D4	D5	D6	D7	D8	D9
R	212	216	220	223	226	231	234	236	241
L	212	217	221	225	226	230	233	238	241

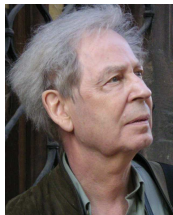
## Dezile FRAUEN (mm)

	D1	D2	D3	D4	D5	D6	D7	D8	D9
R	194	198	200	203	206	210	215	217	223
L	192	196	200	205	206	210	212	216	221

So different are span widths!  
(... little in comparison to other hand characteristics)



Chopin's hand



Prof. Dr. med. **Christoph Wagner** (\*1931)

Head of the Institut of Music Physiology at the Hannover University for Music and Drama from 1974 to 1993. With the foundation of this institute, he was the first to succeed in establishing research and teaching of music physiology at a European university of music.

Medical and musical studies had preceeded, as well as ten years of basic research on music-physiological questions of music-making at the "Max-Planck-Institut für Arbeitsphysiologie", Dortmund. In 1992, he organized the first international symposium of musicians and physicians in Germany.

He is co-founder of the "German Society of Music Physiology and Musician's Medicine" (DGfMM), which appointed him honorary member in 2001.

more informationen: [www.hand-und-instrument.de](http://www.hand-und-instrument.de)

## Christoph Wagner Hand und Instrument

### Musikphysiologische Grundlagen – Praktische Konsequenzen

in German language

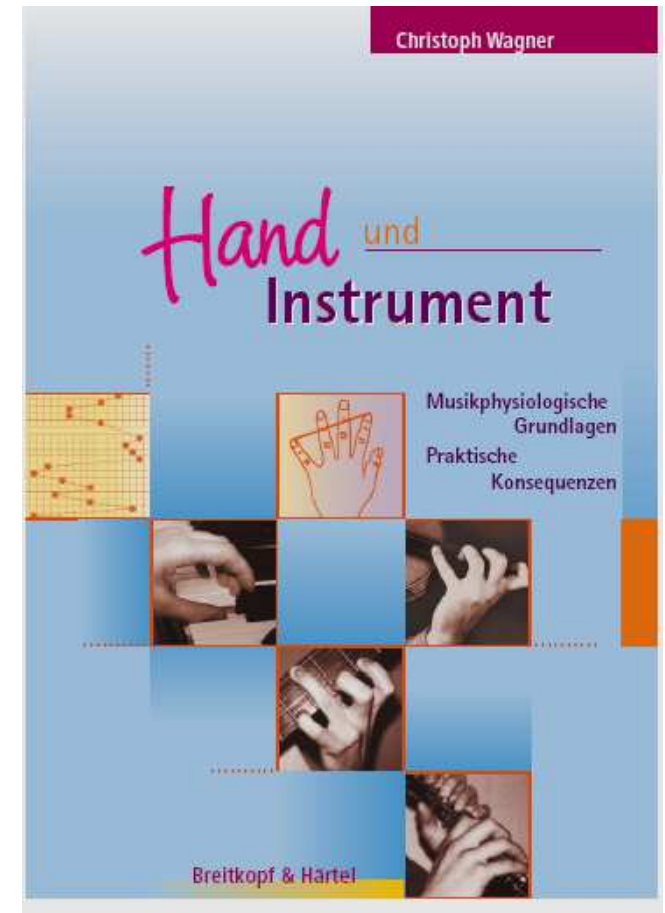
in co-operation with  
Ulrike Wohlwender

372 pages with 120 illustrations,  
numerous tables, diagrams and  
5 papers for hand  
measurement.  
Cut flush binding

Breitkopf & Härtel 2005  
ISBN 3-7651-0376-4  
€ 39.-

**Textbook, reference work and  
advice for**

- Musicians, instrumental pedagogues, music students and amateurs
- Instrument makers
- physicians, physiotherapists and psychotherapists in the field of musician's medicine
- Feldenkrais-, Alexander-, Eutony-teachers etc.



Breitkopf =====  
===== PÄDAGOGIK

***Hand und Instrument** shows, how strong the individual differences also of musicians' hands are and which consequences can result for learning an instrument and a possible later career.*

**Breitkopf & Härtel**

# Christoph Wagner: Hand und Instrument

(translation of the German flyer – book only in German available)

content (shortened):

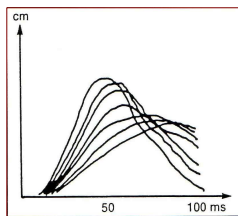
## A. Introduction: hand and instrument – a strained relation?

## B. „The instrument must almost become part of the player“

- The development of the instruments – in consideration of the hand?
- Adaption to the instrument: systematic and historical aspects
- Keyboard instruments – string instruments – woodwind instruments – other instruments
- Instruments for children
- Unusual challenges to the human hand – a summary



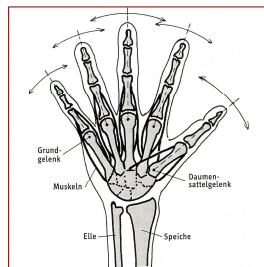
Viola of Franz Zwirger (1763–1830)



How fatigue changes the muscle contraction

## C. Posture and movement: short physiology for musicians

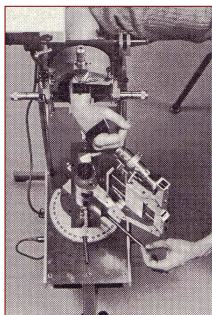
- Physiology for musicians?
- Joints for mobility
- Muscles for moving and holding
- Joints and muscles: The game of forces and counteracting forces
- Aiming movements: The chain-of-joints problem



Muscles for finger spreading

## D. The hand as tool: short anatomy for musicians

- Anatomy for musicians?
- Arm and hand: ancient concept – new challenge
- When playing becomes painful: a checklist
- Shoulder-region, elbow-region, wrist-region, hand and fingers

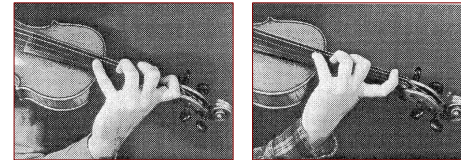


Measuring of wrist mobility

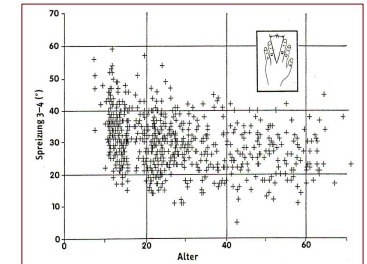
## E. The instrument-specific investigation of the hand

## F. How different are musicians' hands? – results of measurement

- Which characteristics vary the most?
- Hands size, handshape and mobility: inter-individual differences
- Inference from one characteristic to another?
- On alteration of the hand in the course of life
- The constitution of the hand: predisposition? – changes by training?



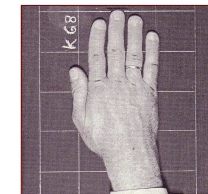
2 hands – same grip



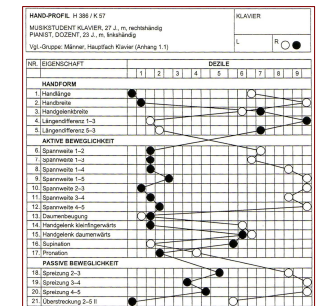
Alteration of the spreading 3-4 to the age

## G. musicians' hands – musicians' fates

- Studying the individual case – hand profiles and backgrounds
- „...always had to work very hard.“ (pianist, 59 y., piano professor, K 68)
- „Relaxation – I cannot hear that any longer!“ (church music student, 26 y.)
- „My efforts are out of proportion.“ (pianist, 27 y.)
- „Sometimes I don't know any more how to move my fingers.“ (violinist, orchestra musician, 33 y.)
- Change to the larger instrument (student oboe / English horn, 21 y.)
- Teacher's hand - student's hand: "He simply doesn't understand me." (student piano, 27 y.)
- Caution: subsidiary subject! (student bassoon, subsidiary subject piano, 22 y.)
- Successful hands: Famous hands from past times – hand profiles of participants in international competitions
- Focal dystonia



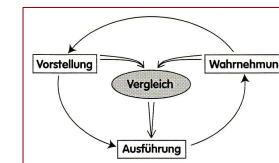
„... always had to work very hard“



Student 27 y. – teacher K 68  
„He simply doesn't understand me“

## H. Decisions

- The hand and the „whole“
- When „is the hand in play“? long-term decisions – daily decisions
- The pragmatic evaluation of the hand: Uncovering manual limitations by playing – recognizing manual limitations without the instrument – simplified measuring of hand size and span widths
- Consequences from the evaluation of the hand: changing the approach to the instrument? – changing one's hand by training? – changing the instrument?



The hand and the „whole“

Simplified measuring of the span width 1-2

