Optimisation of Rowing Performance and Training

Hartmut Buschbacher - København - Jan 21-24, 2010

Deutscher Ruderverband DRV

Germany up to 2008

- The regional centers over time developed into specific unofficial centers for each discipline Dortmund Men's sweep – Potsdam –Women's sculling and only delivery function for other TC!
- Lived on the talents and excellent athletes pool most of the '90!
- Internal Competition between these centers led to athletes moving to centers away from their regional centers and quality training suffering as not enough coaches at these while at other centers coaches only had small number of athletes
- Training structure also inherited from the West –
  - Training in week almost always in small boats, not often with coach, never side by side, little direct competition on water without times
  - Erg not often used for training only if bad weather and then individually without any guidelines on target splits
  - Weights and biking done alone during the week at random times
  - Weekends Sat 2 rows in 4- or 8+ and Sunday one row in 8+, rarely competitive

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
OS	Atlanta				Sydney				Athen				Peking	
WM		FRA	GER	CAN		SUI	ESP	ITA		JAP	GBR	GER		POL
M2-	15	13	(-)	6	9	7	13	16	6	7	5	9	4	7
M4-	9	6	8	7	11	Silber	Gold	Bronze	7	12	Silber	9	6	7
M8+	Silber	5	Silber	10	(-)	Bronze	Silber	6	4	Bronze	Gold	Silber	8	Gold

Germany up to 2008

- The Medal statistic here again, show especially the Men's Sweep problems to peak for the OG – these problems have to do with selection and internal strife
- Internal strife because from 1991 to 2008 every year there were 4 chief coaches at any time – in multiple combinations such as one for both men's sweep and women's sculling or sometimes one chief coach for heavy and lightweight men's s
- Each chief coach had his own selection criteria and preferred different performance tests (For example Potsdam rowing tank test vs Ratzeburg 6' FES Ergo test Drag 190 vs Dortmund 2000m CII Ergo test Drag 130)
- Because individual testing no coherent standards and analysis of trends vs International
- Selection the main problem as I will highlight later in the case of the M8+
- Hugely successful U19 & U23 programs did little to produce real talent on A level
- Many different regional centers led to many different rowing styles and with declining physical fitness the smaller boats got weaker and produced weaker bigger boats
- Massive conflicts in amateur sports with sponsorship for only the M8+ - so financial reward solely for the 8+ while 4- and 2- received little or no funding
- Selection mostly relied only on one trial (always very early in season) so it rewards existing pairings and prevents new combinations and riskier lineups and prevents geographically different pairings due to lack of winter training before trials

Germany up to 2008

- Main problem with selection trials though was that individual chief coaches could ignore trial results and favour their own athletes over unknown faster combinations from other training centers
- No unified or combined preparation before peak competitions anothe factor for German decline, each chief coach chose different preparations, plans, and intensities without ever comparing results or adopt changes (for example Wsculling altitude longer, Msculling shorter, Msweep no altitude)
- Little international comparison, not water times, not ergometer times
- Trainings plans wholesale with little or no individual adaptions (Important because some athletes uni students but others in special army or police programs that allow for full time training with financial support)
- On water training unimaginative and not steered by HF or times, simply distance steady state with occasional split times, rarely side by side
- Finally, another big problem was that chief coaches led by sport director who became more and more involved in sporting decisions despite no background (example – if two chief coaches argued over same athlete he would make decision)

HB Changes 2009

- As with all new beginnings there was a lot of resistance to change initially but rapid improvements helped process
- My philosophy was to increase competition and quality of water training (variety of workouts, intensity changes, target times)
- Increase priority and standards of weight training, increase general not just rowing specific fitness to increase durability
- Individualisation of trainings programs allowed for specific changes to allow different athletes to improve rapidly
- Different workouts and time targets for different events, standard competition programs so entire team prepares together and same process
- Standardisation of performance tests (6k-6k-2k-step test-max power)
- Selection done entirely on performance and over two long distance and two 2000m trials and no exceptions to nominations to boats

Analysis HB of DRV 2008-09

- More direct comparison between regional centers and vs international targets
- Same testing standards and selection for Senior A, U23 and U19
- Better data gathering with coordination with science and diagnostic teams
- Increased communication with athletes and more transparency of testing results and decision making process

German structure Head Coach

Women Sweep

Women Scull

Men Sweep

Men Scull

Lgw. Women Scull

Lgw. Men Scull

Lgw. Men Sweep

Germany Olympic rowing statistics 1996-2009 and 2009 Senior A, U23, U19

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
OS	Atlanta				Sydney				Athen				Peking		
WM		FRA	GER	CAN		SUI	ESP	ITA		JAP	GBR	GER		POL	
W1x	13	5	Silber	Silber	Bronze	Gold	Bronze	Silber	Gold	8	12	21	(-)	8	
W2x	5	Gold	8	Gold	Gold	Gold	5	Silber	Silber	4	Silber	6	Silber	8	
LW2x	8	Gold	Silber	5	Silber	Gold	Silber	Gold	Silber	Gold	10	Bronze	4	4	
W4x	Gold	Gold	Gold	Gold	Gold	Gold	Gold	Bronze	Gold	Silber	Bronze	Silber	Bronze	Bronze	
W2-	4	9	(-)	Silber	6	6	7	7	5	7	Bronze	Silber	4	4	
W8+	8	5	6	6	(-)	Bronze	Bronze	Gold	5	6	Silber	5	7	4	
M1x	Bronze	Silber	10	10	Bronze	(-)	Gold	Silber	7	6	Silber	5	7	5	
M2x	6	Gold	Gold	Silber	4	6	Bronze	17	8	Bronze	7	10	9	Gold	
LM2x	11	Bronze	4	Bronze	4	4	4	5	13	6	6	8	13	4	
M4x	Gold	Silber	Silber	Gold	Bronze	Gold	Gold	Gold	5	6	7	Bronze	6	Bronze	
M2-	15	13	(-)	6	9	7	13	16	6	7	5	9	4	7	
M4-	9	6	8	7	11	Silber	Gold	Bronze	7	12	Silber	9	6	7	
LM4-	5	Bronze	13	12	(-)	10	6	4	11	6	7	np	DNS	Gold	
M8+	Silber	5	Silber	10	(-)	Bronze	Silber	6	4	Bronze	Gold	Silber	8	Gold	
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
W Scull Medals	1	3	3	3	4	4	3	4	4	2	2	2	2	1	38
W Sweep Medals	0	0	0	1	0	1	1	1	0	0	2	1	0	0	7
W Total Medals	1	3	3	4	4	5	4	5	4	2	4	3	2	1	45
M Scull Medals	2	4	2	3	2	1	3	2	0	1	1	1	0	2	26
M Sweep Medals	1	1	1	0	0	2	2	1	0	1	2	1	0	2	14
M total Medals	3	5	3	3	2	3	5	3	0	2	3	2	0	4	38
Germany Total	4	8	6	7	6	8	9	8	4	4	7	5	2	5	83

	M 2-	M 4-	M 8+	LM 4-	M 1x	M 2x	M 4x	LM 2x	F 1x	F 2x	F 4x	LF 2x	F 2-	F 8+
A	7	7	1	1	5	1	1	4	5	5	2	4	4	4
U23	6	3	3	1	4	2	1	1	1	2	2	2	1	1
U19	7	8	1	-	1	1	1	-	1	1	1	-	1	1

Where the medals should come from J

Women Sweep
3. Pl. 1992

Women Scull
2002 Gold
2001 2. and 3. Pl

Men Sweep
2. Pl. 1996

Men Scull
3. Pl 2000

Lgw. Women Scull
2004 2. Pl

Lgw. Men Scull
none

Lgw. Men Sweep
None

German official training centers

Training Center Structure 2009-12

DO | PO B | RZ HH | Ha MD | DD L | RO | SB | H | FRA Dev. | ES Dev.

Training centers yet decentralised

German step test sample analysis

P-Index Case Study

=Watt/(Gewicht+15)^2/3

	kg	watt	CII	Split	Pindex	Distanz	Jahr
Winckless	83	385	06:28	01:37	18,11	2k	2004
Balmary	74	395	06:25	01:36	19,82	2k	2007
Evers-Swindell	80	385	06:28	01:37	18,49	2k	2006
Davidson	72	311	20:55	01:44	15,84	6k	2000
Francia	82	276	21:38.0	01:48	13,07	6k	2009
Glessner	82	290	21:18.6	01:46	13,74	6k	2009
Brodowski	105	570	05:41	01:25	23,43	2k	2009
Waddell	108	610	05:35	01:23	24,66	2k	2007
Waddell	100	590	05:38	01:24	24,95	2k	2000
Brodowski	105	460	18:21	01:31	18,91	6k	2009

USA & GER Women 6k Ergtest Nov/Dez 09

Reveals one of our Problems – Talents are running out!

2	USA	21:18,1
3	USA	21:18,6
4	USA	21:20,3
5	USA	21:21,7
6	GER	21:26,9
7	USA	21:28,1
8	USA	21:28,4
9	USA	21:29,3
10	USA	21:31,2
11	USA	21:33,7
12	USA	21:38,0
13	USA	21:38,2
14	USA	21:42,3
15	USA	21:45,7
16	GER	21:48,2
17	USA	21:49,5
18	USA	21:49,8
19	USA	21:49,9
20	USA	21:50,4
21	USA	21:52,7
22	GER	21:54,2

German Senior A Scullers Sample Results

	CII 2000m	CII 6000m	1x	2. 1x	P4 Step test
Men Sculling	05:58,7	19:10,1	3	1	390
Men Sculling	05:51,6	18:44,7	5	2	452
Men Sculling	05:58,2	18:50,5	2	3	379
Men Sculling	05:50,0	18:43,0	7	4	394
Men Sculling	05:41,4	18:19,8	4	5	415
Men Sculling	06:00,0	19:07,0	6	6	378
Men Sculling	05:56,6	18:53,1	1	DNS	375
avg	**05:53,8**	**18:49,7**			**398**

1st. Small Boats Trial M2-/W2-/LM2-

Männer Riemen				
Final A		06:14		
G. Hauffe/F. Menningen	7:00.31 (1)	88,98%		
T. Seifert/S. Schmidt	7:00.45 (2)	88,95%		
U. Küfer/F. Adamski	7:02.04 (3)	88,62%		
K. Wilke/R. Schmidt	7:04.29 (4)	88,15%		
O & M Rückbrodt	7:11.05 (5)	86,76%	+7" zum 4. Platz	
T. Protze/F. Müller	7:15.70 (6)	85,84%	+15" zum 1. Platz	

Männer Skull				
Final A		06:35		
M. Hacker	7:42.33 (1)	85,44%		
S. Krüger	7:44.29 (2)	85,08%		
E. Knittel	7:45.99 (3)	84,77%		
K. Brodowski	7:46.54 (4)	84,67%		
T. Grohmann	7:47.93 (5)	84,41%		
M. Rocher	7:49.54 (6)	84,12%		

Männer Riemen Leicht				
Final A		06:27		
J&M Kühner	7:15.61 (1)	88,84%		
J&M Schöman-Finck	7:19.98 (2)	87,96%		
L. Oberhausen/F. Prigge	7:21.53 (3)	87,65%		
S. Wallat/M. Röger	7:21.79 (4)	87,60%		
O. Beckmann/O. Tietz	7:22.46 (5)	87,47%		
S. Berghofer/J. Lüke	7:27.84 (6)	86,41%		

Männer Skull Leicht				
Final A		06:48		
L. Hartig	7:43.94 (1)	87,94%		
Hochbruck	7:46.07 (2)	87,54%		
M. Wieler	7:51.05 (3)	86,62%		
J. Koch	7:51.23 (4)	86,58%		
M. Keschka	7:53.12 (5)	86,24%		
F. Overmann	8:02.62 (6)	84,54%		

Frauen Riemen				
Final A		06:54		
M. Sinnig/K. Hartmann	7:51.82 (1)	87,75%		
K. Reinert/N. Wengert	7:53.05 (2)	87,35%		
Schmutzler/Hennings	7:57.42 (3)	86,72%		
K. Naumann/A. Kniest	7:58.88 (4)	86,45%		
K. Thiem/U. Sennewald	8:10.70 (5)	84,37%	+19" zum 1. und 12" zum 4.	
N. Drygalla/F. Kegebein	8:26.39 (6)	81,76%		

Frauen Skull				
Final A		07:08		
P. Waleska	8:23.97 (1)	84,93%		
C. Huth	8:26.43 (2)	84,51%		
S. Schiller	8:29.84 (3)	83,95%		
S. Dunsing	8:35.38 (4)	83,05%		
T. Manker	8:40.90 (5)	82,17%		
J. Domscheit	8:49.50 (6)	80,83%		

Internationaler Vergleich Leistungsüberprüfungen

ITA	October	November	Dezember	Januar	Februar	März	April
Wasser		LS 1x/2-				1. KBÜ 1x	2. KBÜ 1x/2-/2x
Land		CII Ergotest 6000m		CII Ergotest 6000m	CII Ergotest 2000m		

USA	October	November	Dezember	Januar	Februar	März	April
Wasser		LS 1x/2-/4-	LS 4x/8+	LS 2x/4-/4x			
Land		CII Ergotest 6000m		CII Ergotest 6000m	CII Ergotest 6000m	CII Ergotest 2000m	

GB	October	November	Dezember	Januar	Februar	März	April
Wasser	LS 1x except WM/EM		LS 1x/2-		LS 1x/2-		KBÜ 1x/2-
Land		CII Ergotest 2000m			CII Ergotest 5000m		

GER	October	November	Dezember	Januar	Februar	März	April
Wasser		6k 1x, 2-				LS 6km 2-	2- Trials 2k
Land	Steptest		CII Ergotest 6000m	CII Ergotest 2000m	CII Ergotest 6000m	CII Ergotest 2000m	

Finale M8+ WM 2006: Prozentualer Abstand zum Sieger

Finale M8+ WM 2007: Splitzeiten

Finale M8+ WM 2007: Prozentualer Abstand zum Sieger

Finale M8+ OS 2008: Splitzeiten

Finale M8+ OS 2008: Prozentualer Abstand zum Sieger

M8+ 2008 vs 2009

- **2008**
- **2009**

M8+ 2009 CII Ergotest Results

	CII 2k	CII 6k	Stufentest
Athlete 8+	06:01,9	19:08,1	345
Athlete 8+	05:59,0	19:22,3	347
Athlete 8+	05:51,0	18:54,0	359
Athlete 8+	06:15,0	19:55,6	324
Athlete 8+	06:06,0	19:52,4	312
Athlete 8+	06:03,5	19:17,6	345
Athlete 8+	05:57,1	18:55,6	374
Athlete 8+	06:01,7	19:26,8	335
avg	06:01,9	19:21,5	343

GER M8+: Mittelwertvergleich Körperhöhe und Körpergewicht bei OS 1988 - 2008

M8+ training 2009

- SR 24 9 minuten 3000m Split 1.30
- 250m 36.5 seconds or 1.13 split rowing into piece, not standing start
- Fastest in time trials by %

WK Profile Luzern M4x – No POL/AUS

WK Profile Poznan M4x

WK Profile Luzern M8+

WK Profile Poznan M8+

Poznan 2009 % to World Best Times

Frauen Olympische BK		Männer Olympische BK		Alle Olympischen BK	
GRE LW2x	98,9%	NZL 1x	100,2%	NZL M1x	100,2%
BLR W1x	98,7%	NZL 2-	99,5%	NZL M2-	99,5%
UKR W4x	97,5%	NZL LM2x	99,3%	NZL LM2x	99,3%
POL W2x	97,5%	POL M4x	99,0%	POL M4x	99,0%
GER LW2x	97,0%	GER 2x	98,9%	GRE LW2x	98,9%
USA W2-	96,7%	GER M4x	98,6%	GER M2x	98,9%
USA W8+	96,6%	GER M8+	98,1%	BLR W1x	98,7%
GER W2-	96,2%	GER LM4-	98,1%	GER M4x	98,6%
GER W4x	96,0%	GBR 4-	97,9%	GER M8+	98,1%
GER W8+	95,8%	GER 4-	96,9%	GER LM4-	98,1%
GER W2x	94,8%	GER LM2x	96,8%	GBR M4-	97,9%
GER W1x	93,5%	GER 1x	96,5%	UKR W4x	97,5%
		GER 2-	96,1%	POL W2x	97,5%
				GER LW2x	97,0%
				GER M4-	96,9%
				GER LM2x	96,8%
				USA W2-	96,7%
				USA W8+	96,6%
				GER M1x	96,5%
				GER W2-	96,2%
				GER M2-	96,1%
				GER W4x	96,0%
				GER W8+	95,8%
				GER W2x	94,8%
				GER W1x	93,5%

Men vs Women difference in GM %

	Rudern A Weltbestzeiten						
	SM-A Wbz			SF-A Wbz			
	FZ SM	SM m/s	% zu Prog	FZ SF	SF m/s	% zu Prog	%-Zeit SM-SF
1x	06:35,40	5,06	0,35%	07:07,71	4,68	0,40%	8,17%
2x	06:03,25	5,51	0,07%	06:38,78	5,02	0,45%	9,78%
4x	05:36,20	5,95	0,36%	06:10,80	5,39	0,49%	10,29%
2-	06:14,27	5,34	0,07%	06:53,80	4,83	0,43%	10,56%
8+	05:19,85	6,25	0,58%	05:55,50	5,63	0,70%	11,15%
4-	05:41,35	5,86	0,40%	06:25,35	5,19	0,87%	12,89%
L1x	06:47,82	4,90	1,43%	07:28,15	4,46	2,26%	9,89%
L2x	06:10,02	5,41	0,55%	06:49,77	4,88	0,68%	10,74%
L4x	05:45,18	5,79	0,34%	06:23,96	5,21	0,51%	11,23%

Summery of Germany