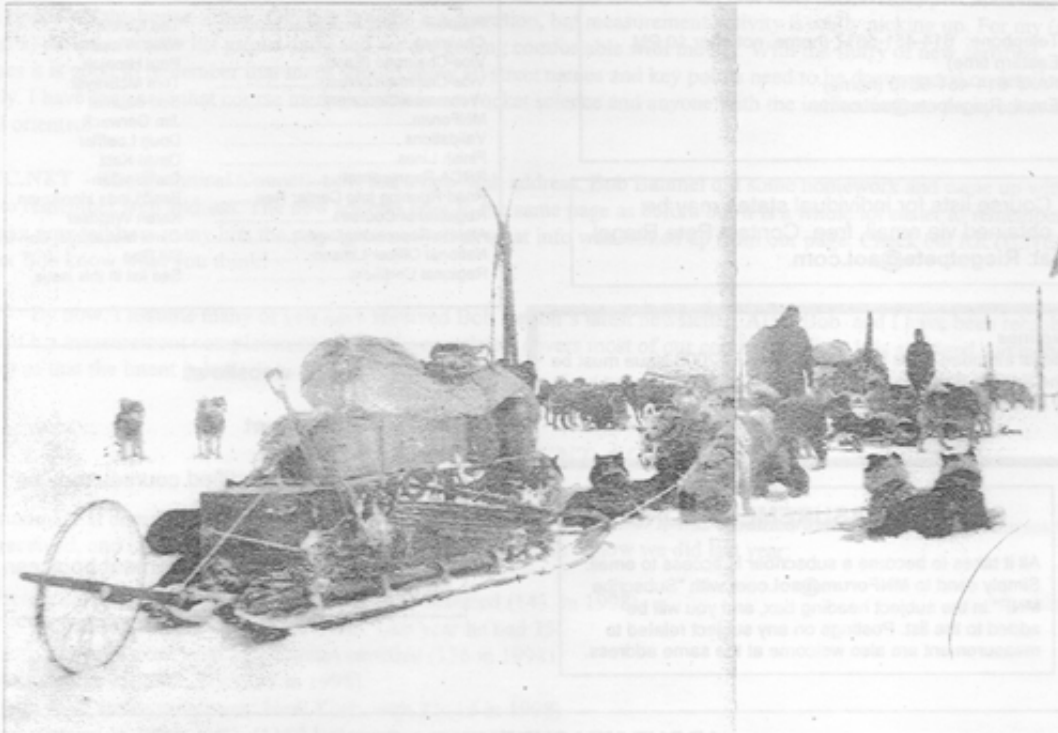


Measurement News



May 2000

Issue #101



Here we see, at extreme left, an example of an early measuring wheel. It was used by Roald Amundsen and his party in their successful effort to reach the South Pole in 1911. Location is Amundsen's depot at 81 degrees south, 30th October 1911. See the article inside.

The photo is reproduced from *The Amundsen Photographs*, by Roland Huntford. The Atlantic Monthly Press, New York, 1987, pp 120-121

MEASUREMENT NEWS

#101 - May 2000

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Chairman's Notes and Quotes

Mike Wickiser - Chairman RRTC

ATTENTION Certifiers! Check the new course listing in this issue of MN for accuracy. Pete and Bob Baumel review each revision as it is posted and have found typo errors on several occasions. Dave Reik caught an omission on one of his courses where he had two versions of a course with two numbers on one cert. Please let me or Karen know of any needed corrections.

Spring has certainly sprung. My mailman is suing me for his hernia and my mail box rests on the front porch, having been ripped off the house siding. Ok, this is some exaggeration, but measurement activity is really picking up. For my (and Karen's) part, the course list grows daily and we are getting comfortable with the list. With the flurry of new certified courses it is good to remember that maps should show all street names and key points need to be documented or detailed clearly. I have long said that course measurement is not rocket science and anyone with the inclination can do it, but it is detail oriented.

RRTC.NET - The Technical Council now has a new web address. Bob Baumel did some homework and came up with an easy to remember web address. The new address goes to the same page as before but it is a whole lot easier to remember. Bob can now tell how many hits the page gets, as well as what info was looked up from our page. Check out RRTC.NET and let Bob know what you think!

AIM - By now, I assume many of you have received Bob Letson's latest newsletter, AIM. Bob and I have been rehashing some of his measurement complaints recently. His newsletter covers most of our communication. It is abridged somewhat but not so that the intent is lost.

1999 MEASUREMENT ACTIVITY

This summary is based on the course list as it existed on February 29, 2000. It was assumed that all of the 1999 courses had been received, and indeed few have been received since then. Here is how we did last year:

Most active certifier: Tom McBrayer - 140 courses certified (143 in 1998)
Most active measurer: Chuck Hinde, with 36. Last year he had 35
Most active state: Texas, with 129 courses certified (136 in 1998)
Measurers active in 1999: 313 (297 in 1998)
State with most active measurers: New York, with 22 (13 in 1998)
Courses certified in 1999: 1182 (1158 last year)

36 people measured 10 or more courses last year, accounting for 51 percent of the courses certified.

STATUS OF CERTIFIED COURSES AS OF FEBRUARY 29, 2000

Active courses (including renewed courses)	10159
Courses renewed after 10 year expiration	168
Total courses	18882
Non-map (these courses were certified in the early 1980's without maps on file. They are considered unrenewable)	539

MEASURING WHEELS AT THE SOUTH POLE

In 1911 two parties set out from different starting points for the as-yet-unreached South Pole. The party of Roald Amundsen achieved the pole on December 15, and returned to report success. Captain Robert Falcon Scott's party arrived at the Pole on January 18, 1912, worn out from man-hauling (Amundsen used dogs) and short of food. There they found Amundsen's tent and a note for Scott. Scott's party, ill, starving and exhausted, died on their return route at their March 21 camp, eleven miles short of their supply depot.

As distance-measuring wheels with counters were used by both parties, affixed to their sleds, some may find this to be of interest. Scott's sledgeometer may be found in the London Science Museum. It is a spoked wheel with a smooth steel rim, and a wooden-cased counter box mounted near the axle. The rim has pointed spikes protruding at regular intervals of about 4 cm. The descriptive card says that somewhat different readings were obtained depending on the character of the snow, much as we see today with tires giving slightly different calibrations depending on the calibration road surface.

The following excerpt is from *Scott and Amundsen - The Race to the South Pole*, by Roland Huntford. Atheneum, New York, 1984, pp 447-450. Your Editor thought it one of the best books he's read.

In November 1909, A. R. Hinks, Lecturer in Surveying and Cartography at Cambridge University, held a seminar at the Royal Geographical Society in London on determining position near the Poles. It was occasioned both by the Cook-Pearry controversy over which, if either, reached the North Pole, and by Scott's forthcoming attempt on the South Pole. It was attended by some highly qualified navigators and explorers. Scott was present, but he politely ignored what the specialists had to say. He eventually arrived on the Polar Plateau using conventional Naval routine, which Bowers, a conventional Naval officer, obediently followed.

What it meant was this. Every day, around noon, Bowers took an ex-meridian sight for latitude, and in the evening another for longitude. The calculation of both is tedious, taking (in those days without pocket calculators)

perhaps an hour of laborious arithmetic and Bowers, as Scott described it, used to be 'coiled in his [sleeping] bag ... working out sights long after the others are asleep'. Scott clearly approved of this as praiseworthy devotion to duty. He did not consider that with the exhaustion of man-hauling at high altitude, rest was more important. It was, in any case, an unintelligent waste of effort. Bowers was racking his brains for a few hundred yards of meaningless accuracy.

At high latitudes, the convergence of the meridians makes the degree of longitude small. At the head of the Axel Heiberg Glacier, 86° S., for example, it is a bare four miles, instead of sixty miles at the equator.

The Hinks seminar indicated that longitude fixes were therefore mostly unnecessary. What was required was to steer accurately due south towards the Pole, for which the simpler observations for latitude and compass error would do.

Amundsen saw the report of the Hinks seminar in the *Geographical Journal*, and took the advice that Scott ignored. He used the meridian sight for latitude, which is simple to calculate and takes a few minutes. He believed that saving mental as well as physical energy was a vital rule of safety.

Amundsen reasoned that in any case an elaborate procedure would be needed to fix the Pole, so he might as well save himself trouble on the march. He therefore navigated with a sextant, instead of a theodolite like Scott because, although less accurate, it was simpler to use. Its one drawback was the necessity of an artificial horizon. This is because a smooth, absolutely level natural one, on which a sextant depends, is only found at sea. The artificial horizon was a tray of mercury to reflect the image of the sun. In case the mercury froze, Amundsen also took an artificial horizon made of silvered glass, levelled with a spirit bubble. For speed and simplicity, he depended on accurate steering and dead reckoning.

One of the more worrying of the Norwegian setbacks the previous season had been the sledgeometers. They were periodically clogged with snow, and had to be nursed constantly.

The sledgeometer was vital for navigation and had to function without

fail. Amundsen's pattern was more robust and legible than Scott's, because the revolution counter was larger and the wheel more securely mounted. The weak link lay in the transmission from the wheel. This allowed fine drift snow, which has an unbelievable capacity to penetrate where it is unwanted, to enter the counter mechanism and jam it, as if it had been so much sand. All winter, Lindstrom had worked away, until he had got every sledgeometer absolutely snowproof and utterly reliable in any kind of weather.

Scott's sledgeometers had developed the same faults as Amundsen's. In his case, however, nothing was done about it. He set off for the Pole with the same unreliable and inaccurate instruments constantly clogged by snow, and regularly breaking down, that he had used on the depot journey; rather like the pump on *Terra Nova*. Despite generous warning, therefore, he had no dependable method of logging his day's run. His steering too, because of inferior sledging compasses and the inherent drawbacks of man-hauling, was doubtful.

The result of all this was that Amundsen, but not Scott, was prepared for navigation in bad weather, nor was Amundsen so dependent on astronomical fixes. He could, and did, skip an observation or two without ill effect. But Bowers absolutely had to take every available one or risk seriously being off course. Even so, the British course was jagged, with perceptible zig-zags, costing perhaps ten or twenty miles over the journey. The significance of that would be grim. The praise afterwards lavished on Bowers for taking more observations than Amundsen on the march was really glorying in, or perhaps covering up, a singular inefficiency. Amundsen's and Scott's navigation reflected exactly their respective margins of safety in transport and supplies. Amundsen could afford more mistakes.

ANSWERS TO LAST MONTH'S PUZZLE

THE PUZZLE:



Where and when did this hair have 11 LAPS TO GO and what colo(u)r was/is it?

Regards,

Malcolm Heyworth

ANSWERS

From Tom Riegel

Puzzle answer:

The guy in the picture looks like someone I went to High School with, but I doubt it.

On time, and measurement, I can only say this: The work day is too long, play time is too short, and the drive home is always shorter than the drive to work.

Subj: MN

Date: 3/14/00 1:40:12 PM Eastern Standard Time

From: Aimssec (**Hugh Jones**)(It's Hugh in the picture)

To: Riegelpete

Dear Pete,

I was beginning to fret about my missing MN, but it came through today.

Quite a shock to see that picture. I don't know which British Students' 10000m championship that was, but it was probably 1980 in Meadowbank (Edinburgh). Could be as early as 1978 though, on the Iffley Road track (the 4 min mile track) in Oxford, where I lapped everyone else in the field. Happy days eh? The hair has faded a bit since then.

THE THOUSAND MILE CLUB

The following measurers have measured more than 1000 miles of race courses. Total miles measured since 1982 is 124846.

PROLIFIC MEASURERS OF SOME STANDARD DISTANCES

Measurer	Miles Measured			
	Marathon Courses	10 km Courses	5 km Courses	
Lafarlette	3391	Scardera 30	Scardera 156	Lafarlette 291
Linnerud	3241	Thurston 22	Linnerud 145	Scardera 214
Thurston	3235	Nicoll 21	Thurston 121	Linnerud 210
Brannen	3165	Linnerud 20	Nicoll 110	White 195
Scardera	3113	Riegel 20	Lafarlette 98	Hinde 182
Nicoll	2846	Lafarlette 19	Courtney 76	Nicoll 165
Recker	2495	Berglund 18	White 71	McBrayer 159
McBrayer	2248	Brannen 15	Smith 68	Brannen 157
Courtney	2037	Cichocki 15	Hubbard 67	Beach 147
White	1889	Knight 15	Brannen 64	Courtney 147
Riegel	1856	Newman 14	Knight 64	Witkowski 130
Hinde	1710	Hubbard 13	Recker 63	Knoedel 111
Hubbard	1621	Nelson 13	Hinde 62	Connolly 104
Knight	1405	Courtney 12	Knoedel 60	Hubbard 86
Nelson	1381	Wight 12	McBrayer 56	Thurston 85
Wisser	1306	George 11	Lucas 55	Newman 79
Beach	1271	Wisser 11	Sissala 54	Recker 78
Smith	1216	Ferguson 10	Wight 53	Dewey 77
Knoedel	1213		Letson 52	Smith 71
Berglund	1196			Wight 70
Newman	1089			Hickey 63
Standish	1067			Polansky 58
Wight	1057			Riegel 55
				Nelson 54
				Melanson 50

Basis of this page is the US Certified Course List as it existed on February 29, 2000

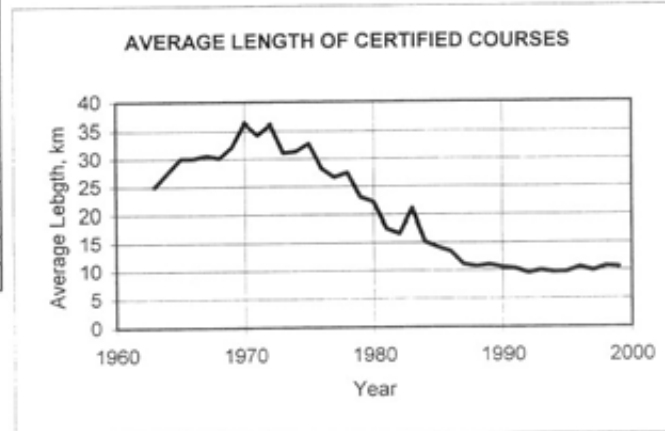
US CERTIFIED COURSES BY YEAR

Year	Courses
1963	2
1965	20
1966	32
1967	25
1968	21
1969	12
1970	23
1971	31
1972	33
1973	60
1974	61
1975	59
1976	58
1977	52
1978	202
1979	333
1980	395
1981	461
1982	520
1983	630
1984	829
1985	1246
1986	1238
1987	1159
1988	1107
1989	1084
1990	1149
1991	1221
1992	1204
1993	1165
1994	1053
1995	1147
1996	1115
1997	1220
1998	1168
1999	1182



In these graphs, the data was taken from the historical list generated by Malcolm Heyworth, and combined with data from the modern list. Malcolm's data was used from 1963-1983, while 1984-1999 used the modern list.

All courses certified before 1982-1984 which did not contain the 1.001 short course prevention factor were decertified, and the currently-used listing was begun.



Year	Avg km
1963	25.0
1965	30.0
1966	30.0
1967	30.6
1968	30.1
1969	32.1
1970	36.4
1971	34.3
1972	36.1
1973	31.1
1974	31.4
1975	32.7
1976	28.2
1977	26.6
1978	27.4
1979	23.1
1980	22.2
1981	17.6
1982	16.6
1983	21.1
1984	15.2
1985	14.2
1986	13.4
1987	11.1
1988	10.7
1989	11.0
1990	10.5
1991	10.3
1992	9.5
1993	10.0
1994	9.6
1995	9.7
1996	10.5
1997	9.9
1998	10.7
1999	10.6

NUMBER OF CERTIFIED COURSES BY CERTIFIER AND YEAR

This data was taken from the course list as it existed on February 29, 2000

Only those certifiers active in 1999 are shown in this list

	1979	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
AM									28	31	50	35	45	41	40	35	54	36	71	466
AS			4	50	2			1					2	1	2		2		3	67
BB			35	72	81	73	66	60	55	52	74	79	49	56	60	35	52	39	33	971
BC								1	1	3	2	2	4	1	3	3	2	4	6	32
BDC														5				4	2	11
BG					14	37	22	31	31	28	36	38	37	50	48	49	33	71	59	584
BS						19	43	34	31	51	27	43	27	36	32	41	27	26	30	467
DB						6	50	71	38	39	45	43	41	39	31	26	43	3	3	478
DK			1	10	7	2	3		2					21		21	19	7	3	96
DL							23	18	16	41	77	68	51	53	66	53	72	53	64	655
DLP								4	8	12	4	5	9	10	5	3	9	13	17	99
DP								10	23	27	35	36	29	29	14	10	11	12	20	256
DR			1	10	15	20	19	19	29	17	19	19	21	20	18	17	42	24	26	336
DS														2	1	3	3	2	2	13
ETM					10	26	36	65	71	87	71	87	103	101	112	131	115	143	140	1298
FC							8	7	20	16	29	9	10	3	9	14	14	6	18	163
FH					6	6	14	11	6	15	4	10	10	6	7		8	3	13	119
FW							2	4	5	6	10	10	1	7	2	1	6	10	1	65
GAN												15	31	24	25	16	42	48	42	243
JD						6	11	6	26	25	28	21	16	13	17	20	28	25	19	261
JS									5	14	6	19	15	19	34	22	26	30	28	218
JW								41	50	67	65	72	69	70	82	79	64	80	66	805
KU									1	5	15	11	14	7	4	7	8	8	15	95
LB								3	13	15	12	9	11	8	14	13	6	15	16	135
MF									11	7	10	7	8	6	8	10	8	6	9	90
MR						1	19	20	25	18	16	17	18	15	16	19	7	11	19	221
MW								10	21	23	15	7	18	16	25	19	19	21	29	223
PH																42	65	41	46	194
PR		1	66	110	155	143	97	85	58	66	62	112	75	51	52	62	52	59	53	1359
RH										4	14	10	33	22	26	25	25	48	23	230
RL		4	48	37	61	6	1									7	16	7	5	192
RN												5	36	18	22	21	39	38	36	215
RR			2	9	27	46	34	12	18	25	16	14	7	14	18	20	32	26	17	337
RS			2	24	48	51	55	76	68	52	83	61	43	38	60	43	61	52	74	891
RT			9	41	66	55	61	51	23	22	31	22	30	23	42	39	34	39	28	616
SH						22	36	31	18	33	17	25	39	32	58	37	33	20	31	432
TK			11	33	32	43	37	29	8	7	19	11	13	9	15	11	20	18	16	332
WB															12	39	41	27	31	150
WC												4	27	21	15	25	18	17	22	149
WN			4	32	125	124	112	106	117	138	148	139	93	81	75	67	36	49	41	1487
Total	1	20	518	829	1246	1238	1159	1107	1084	1149	1221	1204	1165	1053	1147	1115	1220	1168	1182	18826

EARLY CERTIFICATION STATISTICS - CERTIFIED COURSES BY STATE AND YEAR

This data was taken from the file regenerated by Malcolm Heyworth from the NRDC course books.

	1963	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	Total
AK															1	1	2	2	4			10
AL															1	8	3	2	10	9	1	34
AR							1						1	1	1	1	2	3	5	5		20
AZ								1					1	2	2	3	12	17	19	29	17	103
CA		7	1	3	6	2	3	2	2	6	19	12	5	7	42	52	63	80	113	91	2	518
CO	2	3		1		1		2		1					7	13	11	16	23	33		113
CT										1	3				1	1	5	4	3	6	1	25
DC									1	1		7	3	1	1	2	1	2	7	7	4	37
DE																	3	1	1			5
FL									1					4	7	13	26	17	18	21		107
GA											12	2		2	6	23	13	9	7	12		86
HI			1							3				1	1	2	1	6	2	2	8	27
IA				1			1	1	1				1		1	7	2	6	10	9		40
ID															1	1	3	2	1	1		9
IL				1					4	17	2		3	1	9	9	13	20	20	7		106
IN				1						3	1	1	7	3	5	14	8	12	6	18		79
KS			1						1	1				2	2		6	4	3	14		34
KY												1					20	4	3	2	1	31
LA					4	1		1			1		1	1	2	4	2	3	3	7		30
MA		1	1	1		1		2	2		1		2	1	7	16	10	15	24	6		90
MD			1	2	1		1	3		1			2		5	2	1	2	1	6		28
ME															1			2	8	3	9	23
MI					1	1			1	1	3			3	8	8	7	9	13	24		79
MN		1	8	1				1		2	1		3		1		1	8	5	8		40
MO										1		11	7	3	2	13	10	7	6	14		74
MS														1	4	3	7	10	7	1		33
MT									1							3	3	6	1	3		17
NC				2	4		1	1		1		2		1	9	5	10	5	4	6		51
ND						1											1	3	5	1		11
NE			1								1				2	4	19	14	11	2		54
NH								1							3	5	7	9	13			38
NJ		1	6	8				1		3					1	2	5	16	15	22		80
NM				1											3	1	1	2	1			9
NV					1	1			1			1	1	2	5	1	2		2	1		18
NY		7	10	2	2	3	8	8	8	7	6	7		4	19	20	28	27	30	31		227
OH					1		1	1		2	2	3	3	1	4	4	12	10	24	45		113
OK							7	1							1	8	1	8	15	54		95
OR								1	5	2	2	1	2	1	4	8	9	13	18	22		88
PA			2								1	3	5	3	7	8	9	7	3	27		75
RI													1				1	1	1	1		6
SC													1		1		3	1	1	1		8
SD								2		1				1	8	2	1	1	1	2		19
TN									1				2	2	4	2	5	9	8	4		37
TX								1	2	1	2	3	1	1	4	10	12	28	18	15		98
UT													1		2	2	2	2	1	1		11
VA								1	1	2	1	1			1	8	6	13	13	12	1	60
VT												1			2		4	4	1			12
WA				1					2	1	1	1			1	4	16	9	8	21		65
WI					1	1				1	2	1	3	1	4	6	13	8	1	7		49
WV																1	2	2	1	8		14
WY														1					1			2
Total	2	20	32	25	21	12	23	31	33	60	61	59	58	52	202	333	395	461	520	630	8	3038

NUMBER OF CERTIFIED COURSES BY STATE AND YEAR

This data was taken from the course list as it existed on February 29, 2000

	1979	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
AK		1				1	4	4	5	6	10	10	1	7	2	1	6	10	3	71
AL		2	14	8	17	12	11	5	26	27	39	25	28	17	20	24	37	31	25	368
AR			4	5	9	4	4	8	8	13	4	5	9	10	5	3	10	13	17	131
AZ			13	14	23	20	20	7	10	10	16	9	6	3	8	12	9	6	15	201
CA	1	4	68	103	146	130	94	133	129	88	139	103	87	81	112	76	103	75	95	1767
CO			29	17	15	30	14	20	23	26	35	36	29	29	14	10	11	12	20	370
CT			1	10	17	23	19	21	31	20	20	19	21	22	20	18	43	24	27	356
DC			3	23	25	17	9	11	4	9	7	6	16	11	19	17	11	21	21	230
DE				12	25	18	18	13	13	23	23	18	10	11	4	11	11	8	8	226
FL			17	21	60	52	71	70	63	72	84	74	56	59	74	54	75	54	65	1021
GA			7	20	50	41	28	32	29	30	35	37	30	24	15	31	18	17	22	466
HI			7	6	9	9	9	6	1	3		5		3	3		9	5		75
IA		1	7	5	12	4	16	5	21	11	14	8	11	10	11	13	13	8	13	183
ID			1	1	4		1		1	1	2			1	2				1	15
IL			6	17	11	48	52	45	50	68	70	75	72	69	82	79	64	83	67	958
IN			11	23	36	21	17	8	8	15	10	4	16	16	16	12	25	21	23	282
KS			7	6	12	31	14	21	20	24	23	29	30	33	23	40	24	49	40	426
KY			1	9	19	13	7	16	6	15	7	12	7	1	4	4	11	6	3	141
LA			2	2	11	2		1	5	5	2	6	6	4	8	9	4	7	11	85
MA		2	4	4	17	29	22	17	34	36	36	26	37	17	21	19	33	35	30	419
MD			4	8	16	17	28	14	7	17	5	17	14	19	21	19	20	19	14	259
ME			4	3	26	15	6	9	12	11	17	26	17	16	11	7	9	12	7	208
MI			21	27	37	22	36	31	18	33	17	25	40	37	58	37	33	24	31	527
MN			5	11	27	46	32	12	18	25	15	14	7	14	17	20	33	26	17	339
MO			13	14	10	6	8	10	11	4	14	9	7	17	25	9	9	23	18	207
MS			1	3	18	6		2	7	2	1	3	5	1		6	1	5		61
MT			1	8	5	8	1	4	1	1	3	7	10		3			2		54
NC		1	16	41	88	70	72	55	52	61	57	58	34	25	27	42	64	44	47	854
ND			1	3		2	1			1	2									10
NE			4	22	20	25	17	3	5		6	7	7	1	1	5	3	3	9	138
NH			11	11	21	17	16	9	11	12	12	21	34	13	26	28	15	33	25	315
NJ		2	15	13	20	38	46	51	33	35	39	50	62	56	48	36	67	41	35	687
NM			1		3	3	5	3	11	11	15	4	4	4	4	4	8	2	4	86
NV				6	4	5		4	1	4	2	2	4	1	3	3	2	4	7	52
NY		3	28	60	57	48	44	41	45	41	65	43	62	76	52	70	79	44	76	934
OH		1	43	51	46	52	56	64	64	62	60	91	69	52	53	55	32	48	53	952
OK			34	69	72	65	51	54	50	51	74	78	47	56	60	34	50	39	34	918
OR			23	32	32	14	11	11	9	12	13	8	11	8	12	13	6	14	14	243
PA		1	23	24	28	29	38	57	50	48	34	26	50	26	32	44	41	28	33	612
RI			2	1	4	5	1	2	9	1	5	4	10	6	5	5	10	5	9	84
SC				15	32	41	52	37	35	51	25	36	22	29	29	42	27	23	29	525
SD			1	6	6	2			4	1	1	1	2			1	2	1	1	29
TN			3	10	13	10	16	19	9	14	26	23	18	15	21	14	15	38	17	281
TX			10	22	37	97	105	94	71	83	70	85	101	98	105	124	111	136	129	1478
UT				3	6	6	14	11	6	15	4	10	10	6	7		8	3	13	122
VA		1	12	17	21	23	26	24	19	14	26	15	17	12	31	24	24	26	24	356
VT				1	5	3	5	1	4	3	7	8	4	5	1	4	8	1	6	66
WA		1	25	37	53	34	18	20	28	20	14	18	18	15	17	19	7	15	20	379
WI			7		14	22	20	17	4	14	12	5	6	16	11	15	14	21		198
WV			8	4	7	2	4	3	3		4	3	1	1	4	2	5	3	4	58
WY				1				2												3
Total	1	20	518	829	1246	1238	1159	1107	1084	1149	1221	1204	1165	1053	1147	1115	1220	1168	1182	18826

RRTC AT THE WOMEN'S OLYMPIC TRIALS MARATHON

On the last weekend in February, some 200 of the best women marathoners in the United States assembled in Columbia, SC, for the 2000 Olympic Trials race. The course for the race had been designed and measured by Ed Prytherch, the marathon technical director, and pre-validated by an all-women's team. Many members of that team returned to Columbia for the race, including Carol McLatchie, USATF Women's LDR chair, Laura Sawyer and Holly Hargroder of the Carolina Marathon organizing committee, and Janice Addison, who would get another close look at the route by running it as one of the Trials qualifiers.



US Women's Olympic Trials Marathon technical director Ed Prytherch. Ed was also the course measurer.

Those four would all be busy with their own duties before and during the race, so Carol Kane and my wife, Karen, who were also members of the team attending the race, were asked by Carol to act as course observers. Karen would ride in the press truck to make sure the runners ran the course as measured, while Carol would be responsible for making sure the start and finish were properly located.

I was in Columbia to cover the race for *Running Times* magazine, but also brought along my RRTC hat just in case I was called up for any measurement-related duties. After a 13 hour drive from Connecticut which brought back memories of college road trips, we arrived at the Adams Mark Hotel and went on a short run that covered the first and last miles of the course. That run, and a subsequent athletes' course tour, convinced me that Karen and

Carol were right when they told me last summer that Columbia was not a flat city. Having helped validate the men's Trials course in Pittsburgh, I rated the Columbia route definitely harder than that course. The runners' quest for fast times would further be hampered by the weather forecast: sunny and unseasonably warm, with temperatures in the 70s.

Our fun run course, also designed by Ed, ended at the finish line, which provided us the opportunity to assure its proper location. The nail was clearly visible even though it was beneath the scaffolding being erected for the finish line structure, and the finish was in the correct place.

The start, several blocks south on Main Street, was also properly located, but one thing we all immediately noted was that the line, painted in blue like the line delineating the entire route, only extended half way across the road. We informed Holly, Ed and Carol of this and made a plan to extend the line the full width of the road with tape the next day before the start.

During the course tour I noted that several athletes were confused about the SPR. Some asked if they had to follow the blue



Karen Gerweck & Carol Kane stand on the start line. Visible is the white tape they put down on race morning to extend the painted start line the full width of Main St.

line (which was often several feet out from the curb due to the limitations of the paint machine). The guide's answer was somewhat ambiguous, so I butted in with a



Karen & Jim Gerweck on the press truck w/ Ray Lapinski of women's LDR committee. Far left is Basil Honikman, next to him Dick Patrick of USA Today.

definition of the SPR. As a runner I almost automatically follow the SPR in a race if safety allows; I was somewhat surprised to find that some of the country's top runners were unaware of where they could legally run.

By now everyone knows the story of the race and Alaskan Chris Clark's surprise victory, so I won't repeat that here (you can read my account in the June *Running Times* if you want). Perhaps overlooked in those stories is the outstanding job done by the organizing committee, headed by Russ Pate. The marathoners may have complained about the heat and the hills, but to a woman almost everyone had nothing but praise for the first class job done by the race.

In light of the post-race fallout over the top finisher not bettering the Olympic "A" standard, I might expect that future Trials will be pressured to be held on courses as flat and fast as possible, and the organizers will look for different aspects when designing their route. Until then, on to Pittsburgh and the Forbes Avenue hill!

Jim Gerweck

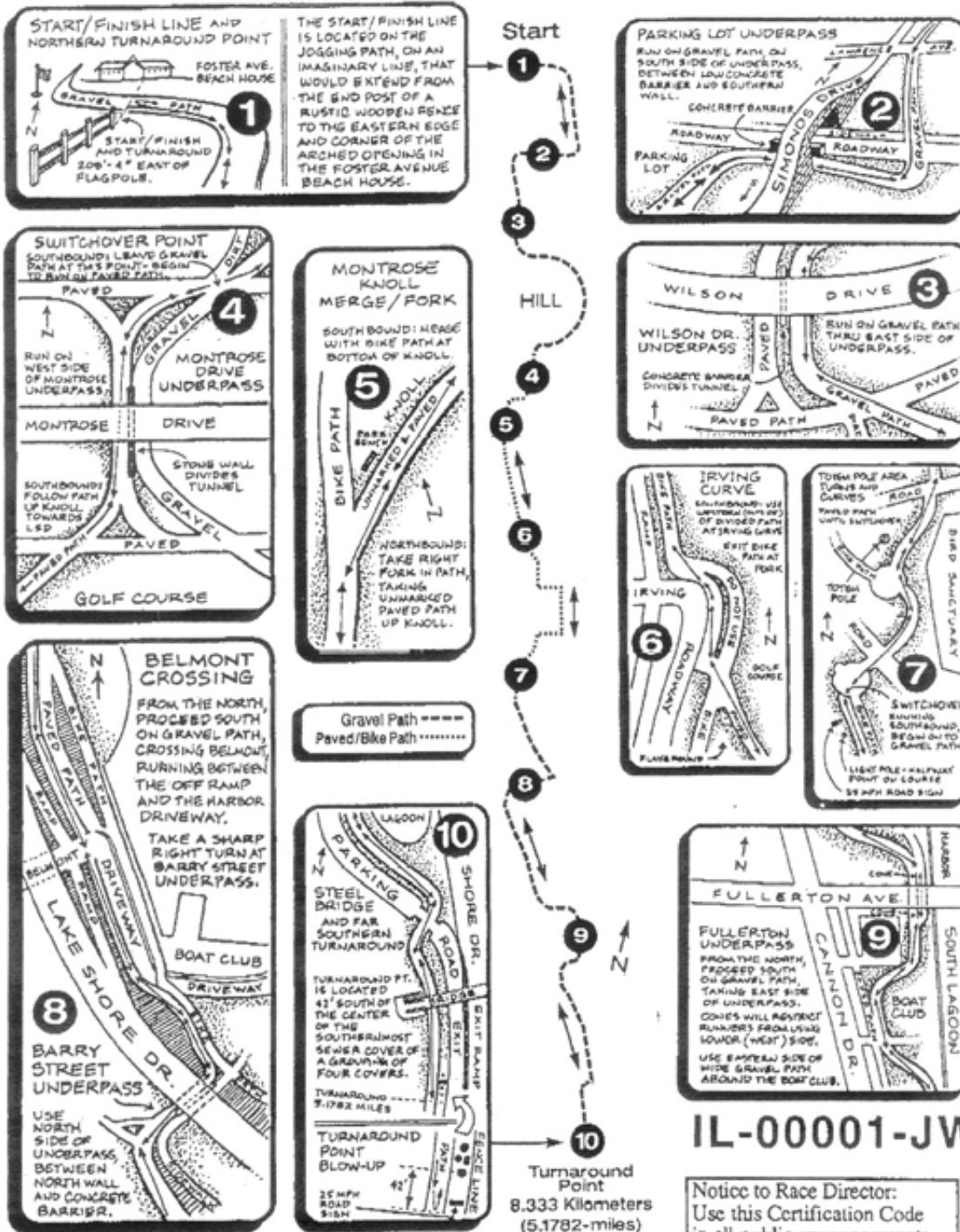
MAP OF THE MONTH

Chicago Lakefront 50k
 Lincoln Park, Chicago, Illinois

- Foster Ave. Beach to North Ave. Bridge -
 On the Jogging Path, Bike Path and Unmarked Paved Path

Three 16.666 Kilometer
 (10.3564-mile)
 Out-and-Back Loops

Course Measured: Jan. 8, 2000
 Measured by: Stuart Schulman
 1 Leg = 8.333 Km (6-leg course)
 Course Map: Chuck Betzold



CHIPS & CHEATS - A THREAD FROM MNFORUM

MNF#0553 21April2000
Chip Mat Placement

I am interested in finding out about the exact placement of the finish line in chip races. It seems as if most races place the finish line in between the two chip mats (as it appears that Boston does), while a few others (including the Nortel Networks Cherry Blossom which I direct) arranged to have the finish line on the leading edge of the first chip mat. If the finish line is on the leading edge of the first mat, does this mean that the time is taken at that point? At what point does the chip actually record the time? I suspect it is at some point while the chip is over the mat which would mean there is not an exact moment (or distance) when the time is taken. Is there any standard procedure?

Based on what I have seen I think the placement of the mats and the finish line can make the exact location of the finish line visually ambiguous. Although the winners presumably have a banner tape to help them see the finish line, I would imagine those finishing behind the winners -- like the second and third place women at this year's Boston -- might assume the finish line is at the lead edge of the first mat.

Also races which start and finish at the same spot offer their own set of challenges -- if you want runners to cross both mats before starting, the mats need to be in front of the runners, yet when they finish you want the runners to cross the mats after crossing the finish line. Do most chip races move the mats, have them straddle the finish line, realign the start and finish lines slightly, or what?

Phil Stewart
pstewart@rrm.com

According to the course certificate, the finish line is the eastern/far edge of the wide yellow painted line on Boylston (w/ BAA and all the other stuff painted in it) I think the first timing mat was immediately past that edge. And in the replays they showed of the women's 2-3 finish, the officials were positioned right on that line. Tom Meagher, who runs the line (and was interviewed by ESPN afterward, although I didn't hear the sound) told me before the race to think of it like a long jump board, where the edge closest to the pit is the line that determines fouls (or in this case, finishes. Perhaps Dave Katz or Tom McBrayer, who use the Chip regularly, could provide more details.

Jim Gerweck
zgerweck@aol.com

Cheats

Roger Gibbons inquired about how cheats are caught at London. London uses Chip timing. When I was there I asked, and was informed that between enroute video recordings and unexpectedly-placed timing mats, successful cheating is difficult. Those who "fail to be recorded" at timing points are informed of their disqualification and given a chance to explain why they did not appear. None ever respond to this offer.

I believe those who "fail to be recorded" and cannot explain why are not permitted to enter future London Marathons.

I doubt there is any system that can catch every cheat. But it's more difficult to cheat your way to a prize than to simply lower your personal best by 10 or 15 minutes.

Pete Riegel
riegelpete@aol.com

MNF#0554 21April2000A
London Cheats policy

Pete's account is perfectly in accordance with my understanding of what happens in London, except for one detail of phrasing:

Pete said:

"..those who 'fail to be recorded' and cannot explain why are not permitted to enter future London Marathons."

For "not permitted to enter" please read "are discouraged from entering"

This is an identical correction to that which the general manager of the London Marathon, Alan Storey, made to the copy of a Runners World (UK) column article that I wrote on cheats a few months ago. I had asked him to check the accuracy of my understanding.

Hugh Jones
aimssec@aol.com

Chip Mat Placement

We own 3 chip systems here in Charlotte. Our s.o.p. has always been to place the leading edge of the first finish mat on the back side (after) the finish. Boston was placed after the finish, it did not straddle.

The electronic field emitted by the mat is not exact, and I have seen cases where a runner has been standing near, but not on the mat, and the chip was read by the mat. The mat is 2 meters deep. Another three meters distance is required before a backup mat can be placed, thus creating a finish

line that is as much as 7 meters long. The electronic field circles the mat configuration roughly 57 times per second, allowing virtually every chip to read instantly upon entrance into the field created by the antennas in the mats. Occasionally, there is probably a delay. We always use a Time Machine backup, and especially in cases where there is prize money, or possible records, we will manually record order of finish of top runners to ensure that a misread doesn't cost somebody.

Start line issue is the same: conservative approach leads us to place it behind the start, therefore theoretically adding an additional 2 meters to one's course, or seven meters if a backup system is used. It should be noted that there is some inconsistency in how different groups manage this process.

Tim Rhodes, President
Event Marketing Services, Inc.
tim@runcharlotte.com

Jim Gerweck is correct. In the long jump, the edge closest to the pit is what determines fouls. But I suspect that most marathoners have more experience running track races than long jumping. And on a track, the finish is determined at the near edge of the 5cm line that is painted or otherwise laid down on the track to mark the finish. In other words, what matters is the first part of the line that the runner reaches, not the last, as in the long jump.

In reality, this detail is probably better known to photo finishequipment operators than distance runners. But if consistency is a concern, then the actual finish line ought to be the near edge of whatever visible indication of the finish appears on the road surface. This would suggest that the mats be placed just beyond the finish line, thus avoiding any possibility of confusion. (I certainly hope that most runners good enough to win races realize that the banner finish "tape" is there for reasons not directly concerning the competition--advertising /appearances/photo ops--and is often not exactly at the finish line.)

Placing the mats just beyond the finish line would also produce a conservative time. Of course, if the mats do not define the finish line (which they do not under current rules), or are not placed exactly at that line, there is always a possibility that the true order of finish will be different from the order of the times produced by the chip system.

Bob H
bobhersh@compuserve.com

Given Bob's statement, then the wide yellow painted strip on Boylston St. is nothing more than the "pre-finish" - the actual line would be the first part after that, and the mats began almost immediately after that. To quote from Ray Nelson's certificate:

Finish - on Boylston St at Boston Public Library. Painted strip is 6' 4" wide and runners finish on the E edge of strip.

I would hope, as Bob stated, that athletes in contention for prize money would pay attention at the technical meeting to find out exactly where the finish is determined (it seems Bogacheva certainly did, with a finish lean as well-timed as any 100 meter man). Still, for a marathoner running on willpower and aching for the line (as Roba appeared to be) misjudgement due to fatigue wouldn't be unlikely.

Jim Gerweck
zgerweck@aol.com

USATF rules are very specific. The finish line is the runners edge of the finish line, whether it is a white line or timing mats.

I have assisted with over 80 Chip races during the past two years. The placement of the mats is always on the finish line. In most cases the mats are over the painted line. If not, they are placed just after (only when the line is not greater than 2").

I have been at the Boston Finish and the NYC Finish. The mats are placed just after the finish line (2").

I'm suprised in Phil Stewart, he has been at enough big time Chip races (usually announcing) and not one race has the finish line between the two mats!

In addition, the Chip system is the best thing out there today for timing races. But, its not perfect. If the system got the 2 & 3 womens finisher at Boston correct, it was by luck. This is the major difficulty of the system. But as I have mentioned in past letters, the Chip systems provides information for the runners that was never available before.

All races (Chip and non Chip) have judges at the finish for tight finishes.

Opponents of the Chip would say: what about close finishers in high density races farther down in the pack? In high density (non Chip) races a toll booth or multiple finish lines would be used. This would require parallel processing based on electronic or manual selects which could produce the wrong places (but relatively accurate time) just as with the Chip system!

I can understand how a spectator or event a runner can become confused by fancy graphics painted on the ground prior to the finish line.

Most races have a finish line structure over head with a finish line sign. The Boston Marathon does not. Boston has 2 digital clocks positioned exactly over the men's and women's finish line. The cable holding the clock is line up with the finish line (I have been on the finish line while this cable has been erected).

Sincerely,
David Katz
katz@firtt.com

**MNF#0555 22April2000
Re Cheats**

Yes, indeed as Roger mentions there was one such incident at the London Marathon in 1992. Incidentally it was in the 50-54 age group, my 55+ and 60+ victories in 1998 & 1999 were straight forward without controversy. A certain George Brown from the West Midlands was credited with a time 1 minute quicker than me and because he had never appeared in any ranking lists and was unknown to running friends of mine in that area, I took the liberty of checking with the London organizers as to the authenticity of the result. There followed athletics press exchanges in which some people supported me whereas others took a different approach and then lo & behold the said George Brown responded in writing in the press himself explaining that he followed a special training programme and wasn't otherwise seen at races in England because his business commitments ensured he was continually travelling! It was several months later that I received a letter from Alan Storey explaining that on an intense study of the video of the event they had declared me the 1st placed 50+ athlete and enclosed the appropriate, to me much valued prize. George Brown had been taken out of the result. Whether he had already received a prize I do not know. Of course the process is easier nowadays with chip technology. However it does underline that without my curiosity being pursued it is unlikely that the true result would have come to light-it must have been quite a job for the organisers to view all of that video just for my sake.

Peter Andrews
peter62.andrews@virgin.net

Chip Mat Placement

Does it make any difference where the chip mats are placed (before, on, after) the timing line so long as the placement is similar everywhere along the course?

At London's Blue Start, where the elite start,

no mats are used. Shooters Hill Road, the starting road, is very wide, beyond the maximum 4-mats-wide capacity of the standard chip matting system. Women started at exactly 8:30, Greenwich Mean Time (Coordinated Universal Time for purists), men at 9:00.

At the finish, mats were placed about 1 meter beyond the finish line. Inconspicuous black lines were painted on the pavement at the proper finish location, and a crew of British officials recorded times at these lines for the first few (hundred ?) finishers, or at least until the runner flow made hand-timing impractical. These were the official times for those so recorded. The rest received chip times.

Pete Riegel
riegelpete@aol.com

I've been following this discussion with interest, especially since I officiated at Cherry Blossom.

I believe Cherry Blossom did it correctly. With an out and back like CB, placing the measured finish line in the center of the mat array, preserves the overall distance of the course. Runners run X/2 meters longer at the start than the same X/2 meters shorter at the finish. OK, the 1mi split is X/2 meters long, but splits aren't certified. (Where X = 7meters). If it's known that a particular out and back course is going to be chip timed, then it is advisable to offset the start and finish by 7meters. Now for point to point courses like Boston, NYC, and PP10K, yes, the start mats should be at the measured starting line with a fake line about ~1ft behind the edge of the mat so that the guy's chips who toe the line are not being read as they stand ready for the gun. Then the leading edge of the finish mats should be on the finish line.

Now for a loop course where runners start and finish in the same direction, the start and finish can not be in the same location. They must be ~7meters separated.

Of course we could always move the mats after the start, but that's work.

Phil Quinn, Gaithersburg, MD
rms@mcrc.org

**MNF#0556 23April2000
Cheaters**

Some may remember a lengthy Los Angeles Times story some years ago about a guy who trained on a small trampoline in his home. Amazingly, this revolutionary training technique resulted in multiple age group wins in LA, New York, and, I believe, event Boston. Of course, he was a fake and was exposed.

Isn't it interesting that the stories offered are almost always that the runner trains alone, rarely races, and has no documentable short distance results to justify such a finish time. I have yet to hear of any accused who has later come back to clear his name with proof of completion and/or to back up his time in subsequent races.

I splashed through the LA Marathon this year and to miss the split mats, one would have had to jump over a wide, curbed grassy median and run on the other side of the street.

A question for experienced Chip timers: does an LA-type downpour affect transponder performance?

Doug Thurston
Thurston60@aol.com

And of course, this was the 20th anniversary of the most (in)famous cheater of all, Rosie Ruiz.

Jim Gerweck
Zgerweck@aol.com

Chip Mat Placement

We split the mats equally before and after the start/finish of the Cherry Blossom 10 Mile. Then we had the official start (with a taped line) one foot downstream (before) the first mat. Start timing was from that point (making the course about 2 meters long at that point.

The finish line then became the front side of the first mat the runners hit at the finish. (We had a nice taped line at that point identifying the finish.) Thus, we canceled out the extra 2 meters that we added at the start. Phil Stewart also moved the finish banner to align with the official finish line. I think we did it right as all timing and judging was done from the same two places defined by the start and finish lines.

John Sissala
sissala@erols.com

MNF#0557 23April2000A Chips

Two items.

First, it sounds like John did an excellent job at Cherry Blossom. It becomes a little hectic when you use the same location for the start and finish with the Championchip System.

Second, the Chip can miss a runner. But it is extremely rare for a runner to be missed at one split point and then picked up at another split point!

David Katz
katz@flirt.com

Just to mention that I timed the 15 mile mark at the LA Marathon with Mike Burns crew using one of my "systems". It was my understanding the purpose of this "check" point was to catch "cheaters" along with the 18 mile point, manned by Chip Hartz, who works for Race Central and the Ikenberry's. Even though it was pouring rain the whole time and the mats were actually under water for a period of time, they performed perfectly and had no problem.

Bill Callanan, Las Vegas, Nevada
BCallan369

MNF#0558 24April2000 Cheating

In no way do I want to seem to be defending cheats, but I looked through the splits at Boston (www.bostonmarathon.org?). Albeit just the top 50 of each gender. Splits were reported every 5 k and at the 1/2. A problem WAS reported at 15 k but I believe they all came in soon enough anyway. I recall about three splits missing for the men (25 k?) and about six for the women, all at 10 k. I know Rosie cheated there, and others since, but doubt any of THESE 100 "missed" just a single checkpoint, at one-way Boston! It's going to be a thorny issue to tangle with to ensure accusations are justified.

Incidentally, the NYRRC then dsq'd Rosie from their race eight months earlier, after some subway riders were among those who then recognized her and came forward. I believe she used that time to enter Boston.

Perhaps some people are hesitant to call her a cheat since she NEVER believed she'd done anything wrong. The fifth runner to finish - make that "to cross the finish" - in 1917 did so 4 s in front of the next runner, and, despite his being from Chgo, that runner actually complained(!), that the guy just in front had gone by in a car. The story was confirmed and the offender dsq'd, yet he was just as delusional as Rosie in his defense. His club? The BAA.

The third runner to CROSS the finish in the first OM, 1896, from Marathon to Athens, was accused by the next runner of riding in a carriage, whereupon the offender admitted it and was dsq'd, preventing a Greek 1-2-3 sweep.

The winner of the next OM, around Paris, has since been accused of cheating, but this was not reported at the time and nothing credible has surfaced. It's all apocryphal.

The first to cross the line in the next OM,

at St Louis, had cramped at 9 mi and ridden to the stadium, which he entered to the accolades of the crowd. The winner finished 15 minutes later. The admission by the offender wasn't well received by the AAU, who almost immediately banned him for life. This ban was reported at the time, and the foremost St Louis researcher assured me unsolicitedly - she didn't wait for my question - that she'd already researched it out of her own curiosity and confirmed it was definitely true. However, to redeem himself, the offender won the BAA less than eight months later! The MetaAAU had gotten the decision overturned. You have to be wary of those guys even now!

Then, of course, the first to cross the line in the 1908 OM, Dorando Pietri, had to be dsq'd by the referee, who'd stood over Pietri as he received all the illegal aid. Johnny Hayes finished 32 seconds later and, a few hours later, was declared the winner.

Then there's what happened to Frank Shorter at Munich. Of the four US OM Champs, the only one to NOT finish to booing was Joanie, though the only time the booing was related to the winner's nationality was at London, and that largely because of what had happened the day before, in the first 400-m final! (That final was rerun the day after the marathon, this time in lanes! However, the two remaining US runners withdrew, reducing the field to a single runner, conceding the British a walkover.)

Road Running, and T&F in general, have what may be called "a rich and colorful past."

Malcolm Heyworth
JHeyworth@aol.com
zgerweck@aol.com

MNF#0560 26April2000 Chip Mat Placement (Cont'd)

I was watching a tape of the Boston Marathon last night and noticed at the start, the elite athletes were placed right behind the wide yellow painted line, then the chip mats were several yards BEHIND them. Obviously, the elites' times began w/ the gun (as they must in accordance w/ the rules) but it leads me to believe everyone behind might have a chip time a second or two slower than their actual net time for the full distance. I know it's picking nits, and moot ones at that, since Chip times are unofficial, but I just thought it was interesting to note. Do any of our Chip experts have an explanation/commentary?

Jim Gerweck

LEARNING HOW TO MEASURE IT

By Jesse Foley Brink - From *Martha Stewart Living*, May, 2000

In the late fifties, a small group of students from M. I. T. measured the length of the Harvard Bridge, which links Cambridge and Boston over the Charles River in Massachusetts. They used Oliver Smoot, a five-foot seven-inch-long freshman, as a ruler. Their findings put the bridge at 364.4 Smoots long. Each Smoot is indicated with a painted tick mark and a numerical reading - "10 Smoots," "20 Smoots," etc. - at every tenth interval. What's interesting is that people actually use the Smoots. The unit, however arbitrary and silly it may be, works perfectly as an indicator of where a person is on the Harvard Bridge. Local authorities deem it sufficiently accurate to locate bridge-traffic accidents in police reports. The moral of this story is not that you should give up your tape measure for the Smoot - you'd have to invite him over every time you hung a shelf-but rather that any measuring device will do when used properly.

For millennia craftsmen took accurate measurements of things (whether pyramids or miniature clockworks) with what we would consider crude tools and strange units. Problems arose, though, whenever measurements had to be shared. All the workers in one area might base their rulers on the foot, but one tool was not likely to be the same length as the next. Governing bodies often set standards for the most common units, but their efforts were too parochial to become widespread. (Who in Germany would want to use a measure based on the foot of an English king?) The meter, derived from a fraction of the earth's diameter, was the first rational, scientific solution to the problem, put forward by the French Academy of Sciences in the late eighteenth century. As nations adopted the metric system, a metal bar marked with a meter of exact size was issued to each. Measurement had finally been standardized.

Nowadays people take for granted that two yards of cloth bought in England will still measure six feet when brought back to the United States, that a four-by-eight-foot sheet of plywood picked up in New Jersey will fit framing done in Pennsylvania. A range of handy, well-calibrated measuring devices determines the dimensions of just about anything. Knowing your inches, feet, and yards doesn't guarantee accuracy, however. You also need to know how to take and use dimensions carefully. The first step is choosing the proper tool, which would be a device scaled appropriately for your project. For paper crafts, using a big tape measure would be clumsy at best. And measuring a room with a twelve-inch straightedge would be silly because you'd have to move it so many times. Whatever your measuring goal, always pick a tool that you are comfortable handling and reading, one with easily distinguishable markings.

With tool in hand, take a moment to study what you plan to measure. For the simplest job, you'll just lay the ruler against a surface and write down one number; even so, that number will be accurate only when the ruler is placed correctly - parallel to an edge, for example, rather than slightly skewed. With more complex jobs, try to take as many measurements as you can from a single starting point. No matter how careful you are, a little error creeps in every time you take a measurement. If you are measuring for shelves set at fourteen-inch intervals, put your tape to the floor and mark the wall at fourteen, twenty-eight, forty-two, and so on; moving the tape up the wall to measure every fourteen-inch gap will only compound the possibility for error each time. Write down all dimensions as you go along. Then remeasure everything and check your figures against what you've written to be doubly sure.

To use a set of dimensions requires equally careful measuring as you transfer them onto the wood, fabric, or other material of your project. After marking your measurements, you should always work on the same side of your penciled marks to be as accurate as possible. Cutting above one mark and below another - especially when working with a material like wood - can change the length of a piece. (Saw blades can remove as much as an eighth of an inch with each pass.) Think about material loss and which side of your markings you work on in terms of the project as a whole. For example, it actually makes sense to cut interior shelves a little small so that they do not have to be forced in, but cloth for a curtain is better made a bit too large, since it is easier to cut away excess than to make more fabric materialize.

THE BODY AS MEASURING TOOL

Your own body can provide measurements on scales ranging from an inch to several miles. Measure the useful body parts against a rule for accurate conversions.

HANDS

The first joint of the thumb is a little more than an inch long on most people. "The hand," or the width of the palm, was once a common unit; now it is defined as four inches and used mostly for measuring horses.

ARMS

The cubit, of Bible fame, is the length of the forearm from wrist to elbow. The span is the length of your outstretched arms from fingertip to fingertip. The yard is the distance from fingertip to nose (for a six-foot-tall person). Fabric shops often use this measure, though rarely are staff tall enough to be accurate.

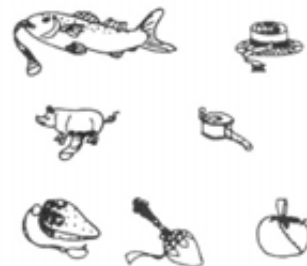
FEET AND LEGS

Most people do not have a foot-long foot. To establish a standard length, authorities used to either take the average of many feet or pick one foot (say, the king's). To use your own foot, remember that its length varies with the shoes you're wearing. For long distances, count strides rather than heel-to-toe steps. The ancient Romans charted their entire empire in this manner.

WHOLEBODY

To determine long distances without taking a single step, you need only know the size of something you can see at the distance you want to measure: You will use this faraway object like a ruler. For example, you can find the distance from a farmhouse to a fenced-in pasture if you know how long the fence rails are. Say your rail is five feet long. Extend your right arm straight out toward the fence, with your thumb up like a hitchhiker's. Now close your left eye, and align the left edge of your thumb with the left edge of one fence rail. Close your right eye, and open your left: Your thumb will have "moved" relative to that particular rail. Measure the distance your thumb's left edge moved by counting the number of rail lengths it has jumped. Multiply this number by ten. Multiply the resulting number by the length of the rail, and you have the distance. In almost any situation something like a fence rail, car, or window frame can become a ruler.

Submitted by Joan Riegel, who collects antique sewing tape measures (see below).



ROAD RACE COURSE MEASUREMENT - IAAF CRITERIA FOR MEASURERS

INTRODUCTION

The IAAF (International Amateur Athletic Federation) was founded on 17 July 1912 as the international governing body for all disciplines of Athletics, which includes road running. It now has 209 members who are the National Federations in each country. It sets the rules and regulations for the sport, ratifies World Records and has a worldwide Development programme.

AIMS (Association of International Marathons and Road Races) was founded in 1981, initially for marathon races only. Races of other distances were included later. The members of AIMS are the races themselves and its objectives are to foster and promote road running throughout the world, work with the IAAF on all matters relating to international road races and exchange information, knowledge and expertise among the members of the Association.

The IAAF and AIMS have been working together since 1990, especially in the matter of course measurement. IAAF and AIMS have set up a system for grading road race course measurers, just as all other IAAF Technical Officials within athletics are graded. At present, course measurement is a relatively new skill and, until the technique is more widely learned and practised, IAAF and AIMS feel that it should be controlled jointly by the two bodies.

INTERNATIONAL MEASUREMENT ADMINISTRATORS

The world has been split into four areas with an administrator appointed for each area who is in charge of course measurement. They are responsible for appointing measurers for courses within their area and should be involved in any course measurement seminars in their areas. They also are responsible for recommending regrading of Course Measurers as detailed below. The International Measurement Administrators are:

Jean François Delasalle	French speaking Africa and Europe plus the Mediterranean
John Disley	English speaking Africa and Europe
Dave Cundy	Asia and Oceania
Pete Riegel	The Americas

THREE LEVELS OF MEASURERS

Course measurers have been split into three grades: "A", "B" and "C". The three grades are allowed to measure the following:

"C" Local courses, including National Championship courses, but no races in the IAAF/AIMS joint calendar

"B" As "C" plus Area Championship courses and races in the IAAF/AIMS joint calendar

"A" As "C" and "B" plus World Championships, Cup and Olympic Games' courses (races run under IAAF Rule 12.1(a), (b) and (c)).

APPOINTMENT OF MEASURERS

If any IAAF Member Federation or IAAF Competition organisers wishes to have a course measured by any other than a local "C" measurer - and this is necessary if the race is to be included in the IAAF/AIMS joint calendar - they should contact the relevant International Measurement Administrator who will arrange for a measurer to be appointed.

NOMINATION AND UPGRADE OF MEASURERS

IAAF and AIMS wish to encourage the development of course measurement worldwide and there is a need for many more course measurers. The following are the criteria for the three grades of measurers:

"C" Successful completion of a bona fide course measurement seminar which was managed by at least an "A" grade measurer

"B" Nomination to be made by the Member Federation which will send the paperwork of four measurements to the relevant International Measurement Administrators

The International Measurement Administrator will then organise a fifth measurement under either the supervision of himself or an appointed "A" measurer at the expense of the Member Federation

If the candidate proves to be satisfactory, the International Measurement Administrator will upgrade the measurer, subject to later ratification by the IAAF/AIMS Working Group.

"A" Must have been a "B" grade measurer for at least two years within which time he/she must have measured eight courses, two of which must be races in the IAAF/AIMS joint calendar. One of the two joint calendar courses must have been measured under the supervision of an "A" grade measurer who should send a report to the International Measurement Administrator

The paperwork for all eight measurements must be sent by the relevant Member Federation to the International Measurement Administrator and, if all proves to be satisfactory, the International Measurement Administrator will upgrade the measurer, subject to later ratification by the IAAF/AIMS Working Group.

MAINTENANCE OF A' AND B' GRADES AND DOWNGRADING

All measurers are required to send a copy of their paperwork for each course on the IAAF/AIMS joint calendar that is measured

to the relevant International Measurement Administrator and the IAAF General Secretariat in Monte Carlo. They must also send a report to their International Measurement Administrator every two years listing their activity in course measurement. If they have not measured a course within two years, they will be downgraded.

IAAF PERMIT AND AIMS MEMBERSHIP CRITERIA

For courses of 10k, 15km, 20km, Half Marathon, 25km, 30km, Marathon, 100km and Road Relays held over the marathon distance, the course must be measured by an approved "A" or "B" IAAF/AIMS course measurer. Should the course be changed from one year to another, it must be re-measured by an approved IAAF/AIMS course measurer. All courses, even if there is no visible change, must be re-measured after five years.

WORLD BEST PERFORMANCES

IAAF does not recognise World Records for road races because of the varying courses (i.e. out and back, loop, point to point), gradients, wind conditions, etc., etc. However, AIMS does have criteria for a world "record" which include re-measurement of a course after the performance.

COURSE MEASUREMENT POLICY

The measurer is appointed by the appropriate International Measurement Administrator and contacts the Race Director to agree the measurement date. The race is responsible for costs of travel, accommodation, meals and a per diem of \$75 per day. The race must send the measurer a detailed map of the course to be measured and details of the safety arrangements for the measurement, e.g. police escort, how many local measurers will accompany him. The race director has to provide a standard thin-tyred bicycle (not a mountain bike) with a typical wheel size of 28-630 or 26-622. He may also need to provide items such as spray paint and a hammer. Several copies of the detailed course map will be required along with directions concerning the road width available on race day and specification of the exact path to be followed at road junctions if this cannot be described as the "shortest possible route".

The measurer rides the "shortest possible route" and this can pose a danger to the measurer as will often be on the "wrong" side of the road. Therefore, it is ideal to have the assistance of a police motorcyclist to direct traffic. If this cannot be provided, there needs to a vehicle to drive with the measurers to "shield" them from the traffic.

If the race requires the exact splits to be measured, the race, must agree the costs of the second ride over the course. The measurer will forward his measurements and report to the appropriate Administrator who will issue the certificate. The central register of measured courses is kept at the IAAF Offices in Monaco. The Administrators and the Technical Director of AIMS send details of all courses measured to IAAF Monaco.

In March *Measurement News* a list of IAAF measurers was published, complete with grades of each, typically "A," "B," or "C." Since then, your Editor, who also wears the hat of IAAF Area Measurement Administrator, Americas, has had several inquiries from "B" level people who believe they ought to be upgraded to "A" status.

I am in complete sympathy with this view, as we in the US have long operated without making formal distinctions between measurers. Those who have measured a lot, and measured well, have developed reputations in proportion to the quality of their work. Thus far, in the US, there has been no need to formalize the differences between measurers. By some osmotic process the big races tend to be measured by the people with the greatest experience, thus the most shiny reputations.

About a decade ago I was asked by AIMS to send in a list of people who, in my opinion, were qualified at the highest level. I submitted a long list. I was then told that the list was too long, and that it might give the perception that the US had all the good measurers. I was requested to prune the list to 8 people, which I did. These eight formed the core group of the present bunch of "A" level measurers. Since then a few more "A" people have been added.

Recently I added all final signatory certifiers (those who were not already "A" level) to the list, with grade "B."

Those who wonder what criteria I used may read the official IAAF version. It is obvious at a glance that almost everybody on the US list is unqualified using those criteria. Using the most obvious example, very few of us began our careers by taking a measurement seminar. Instead, we availed ourselves of the opportunity to simply obtain the instructions, measure, and send in the courses for certification.

Here is a statistical breakdown of the experience level of the US "A," "B," and "C" measurers:

IAAF Grade	Average Courses Measured			Number of Measurers
	High	Low		
"A" Measurers	250	476	43	12
"B" Measurers	80	256	25	24

I have not classified "C" measurers. I regard anyone who has ever measured a course and got it certified as a "C" measurer.
.....Pete Riegel