

# MEASUREMENT NEWS



#16 - April, 1986

Editor: Pete Riegel - 3354 Kirkham Road - Columbus, OH 43221  
614-451-5617 (home, not after 10 PM EST)  
614-424-4009 (work, 7 to 4:30 ex 11-12:30)  
telex 245454 Battelle, Columbus Ohio

Measurement News (MN) is distributed free to all members of the Road Running Technical Committee of TAC (everybody listed in NRDC News). Some foreign people are also included in the free distribution.

Subscriptions are available for \$15 per year. Back issues are available for \$2.50 each.

If you wish to reproduce or report on anything in MN, go ahead, but an attribution would be appreciated.

MN is our way to talk to one another, so that we all know what's going on. It also serves to provide communication between the RRTC Chairman and the regional certifiers. What appears here is not to be construed as the final word on anything. Anything that is an official statement of TAC/RRTC policy will be clearly identified as such.

MN wants to make measurement as good as it can be. All opinions and grievances are solicited. No cows are sacred. If you have a new measurement technique, or if you think things should be done differently, send in your contribution to MN. Your opinion will be given space. Nothing changes until somebody tries!

Nice, clean typed stuff is most welcome, but send what you can.

\* \* \* \* \*

## NEW CHAIRMAN FOR RRTC

Many of us are aware that Allan Steinfeld is extremely active in the road running sport, being associated as he is with AIMS and IAAF and serving as well as technical director of the Pittsburgh and LA Marathons - both big, visible events. He's also associated with NYRRC, and works hard on the NYC Marathon.

Wearing all these hats in addition to his RRTC one became more than he wished to handle. He asked me if I would be willing to assume the post, and I accepted. So your editor is now your RRTC Chairman.

Readers will note that no election occurred, The positions on RRTC are appointive. If you are curious about how it works, read the TAC bylaws. I am still digesting them myself, so I will attempt no explanation of them here. I would only get it wrong.

My first official act was to ask Wayne Nicoll to take over as Vice Chairman (East). He has accepted. I also made formal the appointment of Harold Tinsley as Treasurer of RRTC. Neither Harold nor I have a clear idea at this time what the job entails, but we will dope it out.

I plan no immediate changes. I would like to do as good a job as possible, so I will take this opportunity to ask everybody, whether RRTC member or not, to write to me with your thoughts on the following (or any other thoughts):

- 1) What should be the function of RRTC?
- 2) Are there jobs that RRTC should be doing that are not being done? If so, who might do them?
- 3) Are there existing jobs on RRTC that are unnecessary?
- 4) Is there a position on RRTC that you feel you are more qualified to fill than is the present holder of that job? Including the Chairman.

#### COMMON MISTAKES IN MEASURING

*- This was written as a handout to new measurers.*

1) Failure to measure the shortest possible route. Do not attempt to measure "where the runners will run". This is not a route that all will agree on exactly. The shortest route is. The reason shortest route is used in measurement is that it is clearly defined and everybody understands what it means.

2) Undefined corners - path must be so clearly defined that a rider could use your map and ride exactly where you rode.

3) Using the old two-sets-of-marks method of layout. Lay out one set of marks and stop at those same marks on subsequent rides.

4) Sloppy paperwork and map. The map is the final product in the certification files. Others who have never seen your course may have to use it to follow your route. Assume the reader knows absolutely nothing about your course, and make the map accordingly. Locations of start, finish and turnaround must be exactly spelled out so they could be found even if the paint was gone.

Receiving sloppy paperwork will make your reviewer grumpy. It's hard to follow. Give the guy a break. Put yourself in his place. Have pride in your work.

5) Failure to include a calibration course document with the measurement data. Do not assume we have it on file. If you use a calibration course, it is your responsibility to obtain the proper document from the person who informed you of the calibration course.

6) Incorrect metric conversions. 10k is not 6.2 miles. It is 6.21371 miles. Use an accurate conversion table, or figure up from the fact that 1 inch = 2.54 cm exactly.

7) Failure to answer the questions completely. Check your work.

### SHORT CAL COURSES

Bob Thurston writes: "Bob Baumel's paper confirms some of my hypotheses and I will try to collect more data. I have a hunch we may have to go with shorter cal courses so they can be close to and more similar to race courses. Then maybe we can use your start-up wobble findings for guidance on adjusting for short cal courses?"

Ed. Note - I've used a short cal course on two occasions. On both occasions there was no nontrafficky road in the course area, but a very nice straight stretch on the race course itself. One course was 1500+ ft, the other was 1900+ ft. Given the opportunity, I still use full-size courses unless prevented by circumstance.

### MN LEARNS TO REPRODUCE

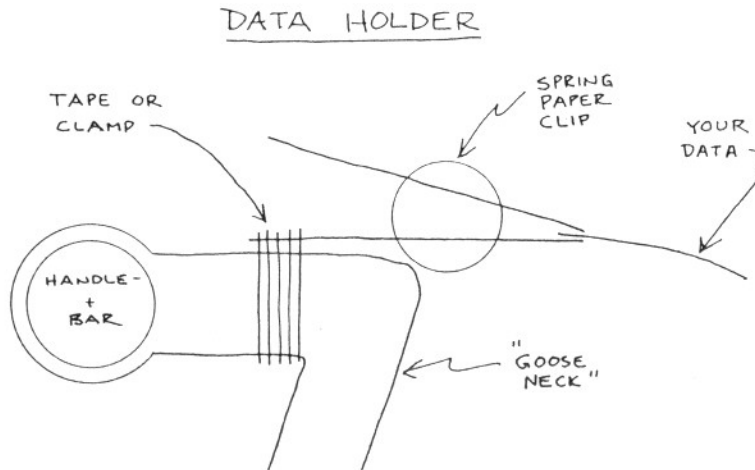
I got a fat envelope from Adirondack TAC on 3/14. Upon opening it, what to my wondering eyes should appear but a copy of February MN, copied on a different copier. George Regan is distributing it to people he thinks can use it.

I think that's great. I have not got the energy to expand MN beyond its present distribution level (around 60), even if people do pony up \$15 for a year. I'd much rather the word got around like George is doing it.

So, if you want to copy, distribute - even sell it for what you can get, please do so with my blessing. There are lots of folks out there I'd like to send it to, but as a one-man show there's a limit to the envelope-stuffing I feel like doing.

### DO YOU HAVE A GOOSE NECK?

Bob Pevril says "If you have a "gooseneck" on your handlebars this is a perfect little "Data Holder" which can be affixed to it. My son says it ain't nuthin' but a dadgummed paper clip but he's lacking in vision!" He sent me a sample, and here's a picture of it. If you write to Bob about it, better not call it a "doodad". I did, and was taken to task for it. It is a Data Holder.



MEASUREMENT DISAGREEMENT - ELIMINATORS AT FAULT?

David Katz called with a true-life example of a panic situation that occurred recently at the measurement of a marathon. Two of the riders were using pneumatic tires, and the third was using Eliminators. Considerable temperature change occurred during the day, and all calibrations changed by about 12 counts/km (19/mile). Unfortunately, the calibrations did not change in the same direction for all riders, and this caused a momentary panic when it was seen that a huge disagreement between measurements occurred, in spite of all the riders riding a pretty good line. The following numerical example illustrates:

	<u>Precal</u>		<u>Postcal</u>		<u>Avg</u>
	c/km	c/mi	c/km	c/mi	c/km
Rider A - lead rider	9320	(14999)	9308	(14980)	9314
Rider B - follow rider	9320	(14999)	9332	(15018)	9326

Assume now that both riders followed a perfect line, and that the "true" constant for each turns out to be the average.

"A" calculates that he should ride  $9320 \times 42.195 = 393257$  counts.  
 "B" calculates the same count.

"A" lays out the course. Since his calibration has changed, the true length he lays out is  $393257/9314 = 42.222$  km. He does not yet know this, since he has not recalibrated.

"B" rides 42.222 km, to the same mark as A. In doing so he uses:  
 $42.222 \times 9326 = 393762$  counts.

He figures he has gone  $393762/9320 = 42.249$  kilometers  
 But "A" thinks the distance is 42.195. Wow! 54 meters disagreement!

Here's what happened:

"B" really rode 42.222 km. He rode perfectly, as did "A". Like "A" he does not know his exact distance since he has yet to recalibrate.

so, until they recalibrate,

"A" thinks the distance is.....42195 meters  
 The distance is.....42222 meters  
 "B" thinks the distance is.....42249 meters

Once they recalibrate they see that both got exactly the same layout distance. In the meantime, however, they are stuck with a 54 meter disagreement, which is way outside the 0.08 percent allowed. Moreover, they are mumbling to themselves because they can't figure out what went wrong.

Users of Eliminators should be aware that this kind of disagreement is possible, and not panic. As the day goes by, the normal pattern is for a pneumatic to expand (decreasing counts) and an Eliminator to squash down (increasing counts). If a huge disagreement occurs, a simple side-by-side ride between two points can give a feel for whether the difference is due to calibration change. This can be done before returning to the cal course.

SHOULD COURSES HAVE A NEGATIVE ALLOWANCE ON VALIDATIONS?

In the March NRDC News Ken Young published his thoughtful piece "Shortness of Road Race Courses". Being dissatisfied with Ken's methodology, Bob Baumel fired off a 17 page letter to several of us interested in this. If you want a copy I'm sure Bob will be happy to send you one. In it he reiterated the idea, long held by many of us, that a course should not be disqualified unless the measurement shows it to be clearly short. Bob concludes:

(To: Ken Young)  
30 Mar 86

JUDGING VALIDATION MEASUREMENTS

You and I have both done probabilistic calculations in which Bayesian methods were used for combining information from the validation with information from the original certification. Now I do think that the original certification must be taken into account when judging the result of a validation. But I DO NOT suggest that we do Bayesian probability calculations when judging the results of actual validations. One problem with this Bayesian approach is that it requires us to make rather subjective judgments as to the reliability we can assign to the original certification measurements; thus it would lead us to judge the validation differently depending on whether we assume the original measurers to be "novices" or "experienced" measurers or "experts". This, I feel, has no place when judging the result of a validation. In effect, it would establish several different classes of certification, even though the rules specify only ONE type of certification.

As I see it, the proper way to account for the certification measurements is by assigning the existence of the certification a certain LEGAL "WEIGHT". Then when the course is validated, we should judge the validation measurement on only its OWN merits and ask whether this measurement, when so considered:

- a) Demonstrates the course to be SHORTER than advertised, or
- b) Demonstrates the course to be LONGER than advertised, or
- c) Falls in a "GREY REGION" where it is unable to say whether the course was shorter or longer than advertised.

Clearly, the course should be rejected in case (a) and accepted in case (b). In case (c), i.e. the "grey region", the proper approach is to ACCEPT the course, because of the legal weight which was assigned to its original certification. In other words, only a measurement actually showing the course to be SHORT can override the certifica-

tion.

This is really just what Pete Riegel and Bob Letson were saying a few years ago. But I think that I have only now fully grasped its significance. If a certification can be invalidated by a measurement which fails to show that the course was either shorter or longer than the advertised race distance, then the certification was little more than a worthless scrap of paper. Perhaps the main reason why Bob Letson became so disaffected with the system was that, after he had contributed so many years in developing the certification system, we had greatly DEVALUED his role as a certifier. The work done by the people who approve certifications is very important, and this work should be more highly valued. This should be done by assigning certifications a definite legal status as described above.

In saying this, I acknowledge that the certification system is far from perfect. As mentioned previously, there are cases (such as the "Redbud" course) when the course is grossly short, but the certification application gives no hint that anything is wrong. But such cases would certainly be caught when the course is validated. The only difference is that a few more SLIGHTLY short courses can slip through. Of course, no human system is perfect, and we should not expect perfection. The question has really always been one of HOW MUCH shortness we are willing to tolerate, rather than whether we will tolerate ANY shortness at all. You have now admitted yourself that a just-barely-passing validation still leaves a "not insignificant" probability of shortness. The main point is that just about everybody will feel better if the validation is not perceived as such a "threat". Let it be a test that everything was basically OK in the race. But let's not give it the power to arbitrarily or "randomly" disqualify races and performances.

One possible danger in my proposal is that if we will be more generous in judging validations, then people might be tempted to relax their efforts at the certification end. And that would cause a genuine lowering of standards. Consequently, it is important to remain AT LEAST as vigilant as we are now in avoiding short courses in the certification process. This certainly means that we should continue using all of the "safety factors" which are now in the system (as discussed on pages 6-8 of my new supplementary instructions), including the full 0.1% factor, as well as the "better measurement" principle AND the "larger constant". (Note: I appreciate your reference to the larger constant in your recent article.) Another means is by more efforts at educating new measurers on proper procedures, especially in the crucial areas of understanding and judgment in choosing the path to

measure. My new supplementary instructions represent an attempt in this direction (although I probably failed because I wrote too much).

Another danger is that we could get into a "numbers game" by trying to pin down exactly where the "grey region" begins and ends. Basically, I feel that any attempt to establish a precise "algorithm" that will always say whether the course has passed or failed (with no need for human judgment in the particular case) is futile, as it won't settle anything. Thus, as I have written previously, I think we need a panel that will render formal judgments in "close" cases. Such a panel would examine all the evidence obtained in the validation, and would then decide whether the result is in the "Short" region or the "Grey" region. I envision one such panel within RRTC, and another at the IAAF level for judging validations done for world records.

Another question that needs to be discussed in connection with validations is whether the validation should be done before or after the race. It was indicated at the Dec 85 TAC meeting that we might validate the course before the race. And Aldo Scandurra (as well as all the people at AIMS) say that it's preferable to do the validation prior to the race. But also at the Dec 85 TAC meeting, Tom Knight objected rather strongly to the idea of validating before the race. In considering this further, I think that Tom probably has a good point. If we were to set a policy that validations will only be done AFTER the race, it just might help keep everybody a little bit more honest.

There is also a possibility that if some courses can be considered "pre-validated", then courses would no longer satisfy a uniform set of standards. In effect there would be TWO standards: one for the pre-validated courses and another for courses still subject to post-race validation. When measuring courses that will NOT be subject to validation after the race, the measurers may feel strongly tempted to shave the safety factors as small as possible, especially if high stakes such as world records are thought to be involved. It is a tribute to Pete Riegel that when he did the 1985 certification of the New York Marathon (which was considered to include validation along with the certification), he insisted on doing it all strictly by the book, even though at least one other member of his measuring team wanted to do otherwise.

Note that if the more generous interpretation of validation that I have proposed is adopted, then validation would not pose any threat to a competently measured course. Thus, the main function of the valida-

tion, when checking a course measured by "experts", would be to guard against the possibility of fraud. The validation would best be able to perform this function if it is a POST-race validation (and if the race organizers don't know who will be assigned to do the validation until after the race).

Returning to this "more generous" interpretation of validations, the basic idea is that the dividing line between failing and passing should be the boundary between the "Short" region and the "Grey" region of the validation (where these regions are based on consideration of the validation measurement ALONE; i.e. without attempting to combine information from the certification and validation using Bayesian or other statistical methods). The certification measurements are taken into account simply by asserting that the certification cannot be overridden unless the validation comes out in its "Short" region. There is definitely no scientific reason for distinguishing between some points in the "Grey" region of the validation and other points in that same region; thus it is not sensible to set the dividing line somewhere in the middle of that "Grey" region.

This is the position which Pete Riegel, among others, has long advocated. Last November, Pete made the rather surprising announcement that he would be willing to accept setting the dividing line right at the advertised race distance. I don't think this represented a basic change in philosophy; i.e. I don't think Pete was suddenly willing to put the dividing line right in the middle of the "grey" region. Instead, it appears that he had come to the opinion that bicycle measurements are sufficiently biased that all measurements falling below the advertised distance might really be in the "Short" region (as is also assumed by your negative exponential model). I personally find that rather hard to believe. Considering all the sources of error that can affect bicycle measurements, I expect that the "grey" region almost certainly extends SOME amount below the advertised distance. It is possible that, after seeing my rough surface work, Pete is now regretting the statement he made last November.

There is room for legitimate disagreement on scientific questions such as the degree of bias present in bicycle measurements. But such questions can ultimately be answered by sufficient experimentation. It is harder to settle the basic philosophical problems. The "correct" philosophical position is that the dividing line between passing and failing should be the boundary between the "grey" and "short" regions of the validation.

Sincerely,

*Bob Baumel*

**Ed. notes:**

As Chairman, I am in a position to do something about this. I'm philosophically in line with the idea that some shortness should be allowed. The results of Bob Letson's poll, published in December '85 MN, clearly show a that RRTC overwhelmingly supports some shortness allowance, just as was allowed on the SMU track, which was not disqualified in spite of being measured out at a few millimeters short of 400 meters. I'm going to find out what communication to make on this subject, and make it. I'm just learning the ropes as Chairman, and it may take me a while, but it will get done. Advice welcome.



3354 Kirkham Road  
Columbus, OH 43221  
April 2, 1986

Bob Baumel - 129 Warwick Road - Ponca City, OK 74601

Dear Bob,

I thoroughly enjoyed your letter of 30 March to Ken. I had also enjoyed Ken's discourse, although I didn't understand it. His tentative advocacy of a 0.05 percent SCPF didn't strike me as a hell of a good idea either. I certainly wouldn't feel safe with it.

I mentioned, in December '82 MN, two effects that cause the bike to deviate from the measured path. The first was "wiggle", which is a high-frequency, low amplitude effect that is probably in sync with the rider's pedaling rhythm. The second was "wander", which is a longer-term deviation from the SPR. The two combine to cause the differences we see between measurements. I don't suppose there is a very simple statistical way to superpose or separate the effects of the two.

"Wiggle" I would expect to behave as a normal (or close to it) distribution. "Wander", on the other hand, is almost certainly one-sided. And when we throw in the beyond-the-call-of-duty corner cutting some measurers practice, we get a third factor. Calibration drift and roughness effects contribute two more.

I personally try to shave corners a little close, but if I'm a trifle wide I don't sweat it. I think on the average I get pretty close to 30 cm. I find I generally do a pretty good job on the first 60 degrees of a 90 degree turn. By then I'm going so slow that I often lose it on the way out of the turn and get a wobble that outrages my sense of perfection. Nevertheless, I don't go back and remeasure each section on which I wobble. I trust the system to leave me safe. This is what makes our present setup so nice - we don't have to sweat bullets about coming out short because of a few minor errors. We "experts" know that corners are where it's all won or lost, and we do pay extreme attention there. A wander in the middle of a straight stretch to avoid a pothole or something is not anything to worry about. It's good to have such a forgiving process. And the data we get, with intermediate intervals, allows us to throw out a certain interval even if it's in the middle of the lower measurement total, and to substitute the better interval. We have remedies.

On validations I try to ride as closely as possible to the theoretical line. I'm neither merciless nor forgiving.

I tried to find the letter in which I wearily declared myself ready to accept the idea of using the nominal distance as the validation cutoff, but could not find it. In any case, I presently find myself back to the opinion that a 0.05 percent shortness would be appropriate. It's not so big as to be horrendous, but it is enough to remove any sense of foul play from the process. I think Letson said it well in his "Short-Accurate-Long" discourse.

I do believe that the certificate should have some "weight", as you put it. I have stated so forcefully.

The Olympic measurements showed little evidence of one-sidedness, as you pointed out to Ken. I am not familiar with the tests for slowness, but I'll accept your reasoning. I was surprised at the big change that the dropping of Scardera's data made.

I think we now have a definition of the proper line. It's the geometric one. I think everybody pretty well accepts it. Achieving it is, of course, difficult or impossible in practice, and that's what makes competitive measuring so much fun. In spite of the fact that it's fun to "win" a 10k by 1.5 meters (and to crow about it), it's a greater satisfaction to see all the expert measurements fall in a narrow range. I was delighted to see the Olympic data come out as it did. It would have been nice to "win", or at least come out better than I did, but I would not have wanted to win it by an enormous amount. That would have indicated a serious flaw somewhere.

So far every time we get the experts together we get the same answers, and that's reassuring. I talked with Ken about validations recently, and he may be in the process of putting together a list of validations of recently-measured courses to see how they came out. In practice the idea of rejecting at nominal distance has not yet caused a flap, since I'm not aware of any courses that came out marginally short.

Just thought of a horrible example. Wayne Nicoll and I validated Azalea Trail and found that it was slightly short but OK under the rules at the time. We established a proper new start. Next year the race director screwed up and set the start line up wrong, on the short side, but not by much. A "record" was set but rejected, based on the previous year's measurement. Does a validation that gives an oversize number allow the race director to shorten the course to the very edge of acceptability? This could be a problem. It really wouldn't make sense to send a validator out to do another measurement of exactly the same course, except for a start that was shortened by 12 meters. Should records be accepted when jiggling like this is done? Maybe we need to wait and see. Could be a problem.

One reason I like the idea of using the 0.05 percent allowance on validations is that we thus admit to our imperfections, and do not leave ourselves in the extremely vulnerable position of people who pronounce their methods perfect. That's arrogant and looks it. The governing factor in the keeping of records over a long period is consistency. So far we haven't done anything that locks us in to using the nominal distance as the dividing line. I think we should grab the opportunity while we still can. The track decision at the recent TAC meeting is a tip for the wedge.

If the purpose of sport is fun, then TAC should be prepared to show itself as reasonable, and using 0.05 percent is one place to do it. TAC, as a governing body, often has to make decisions that are perceived as harsh in the interest of keeping the sport credible. These decisions ought to be balanced by a general perception that TAC is not generally repressive. I think rejection at the nominal distance is a bit repressive, and I don't think it would hurt record-keeping one iota if rejection was made only when shortness was definitely shown.

I wish I could put better numbers on it, but deep down my gut says it's better to allow something on the low side.

How much shortness? I'd say, 0.05 percent for bike-measurements, until we can come up with a convincing alternative. 0.05 feels right. It's a nice round number, and it's got to be pretty close to whatever ultimate number we come up with.

As for people relaxing their layout procedures, I'd say let them. If they then get shot down at -0.05 then there will be no perception that they have been screwed in any way. But I would not relax our official layout procedures, and I'd continue to use them. They are needed to keep "amateur - measured" courses OK, and a double standard is anathema to me.

In international measurement there is a tendency to apply a safety factor based on the judgement of the measurer. It's not quantified as much as ours is. That doesn't hurt AIMS, because "validation" happens before the race, when there's still time to fix it. What happens when the validator finds a 42196 meter marathon is unclear to me. In theory there would be no need to do anything about it. I remain convinced that a post-race validation is better, while admitting that this may not happen in international circles. This may mean that there will be a subtle difference between US courses and foreign courses, but the difference is small. Foreign people now use the 30 cm rule. That's most of it. They are not totally tuned to the larger constant, but AIMS, I believe, does ask for an extra 0.1 percent as a SCPF. In some cases they don't get it, I'm sure. There's some cleaning up to do internationally (and by TAC), and progress is being made.

For the record, I will state that I now regret the statement I made last November and am now of the opinion that a 0.05 percent shortness should be allowed on validations. This, I believe, would fall on the "definitely short" side of the gray, or indeterminate, area.

This subject is emotionally loaded. I think it will behoove TAC to listen to us on this. It's a way to support the athletes, and it creates a sense that TAC is trying to be fair and recognize the real world, rather than insisting on unattainable ideals.

If we keep chipping away at this something may happen some day.

Best regards,



Fete Riegel

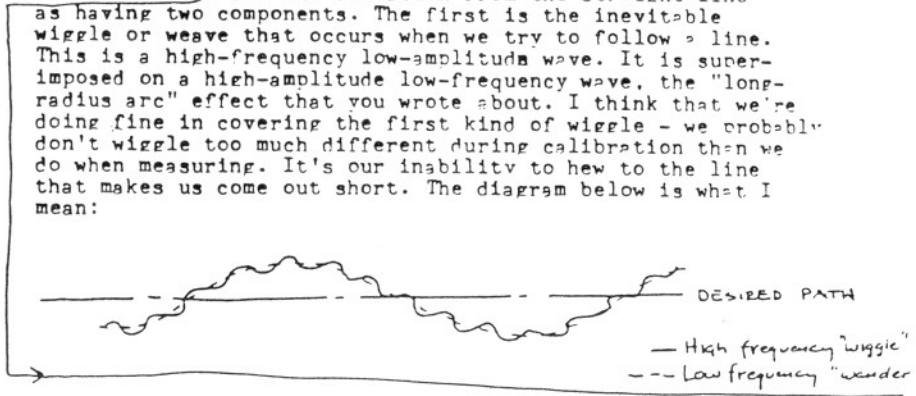
cc: Christensen, Nicoll, Lewis, Letson, Knight, Scandurra, Young

12/27/82

Ben Buckner - Ben, it is now my fourth rainy day off from work at home, and I'm going bananas. Another four days off next weekend. I like to work as little as the next man, but I find myself wishing that those who order my universe would throw some of this time off at me during prime-time. I really don't appreciate all this leisure at this time of the year. With all of your students on vacation now I expect that you have the same job of finding something in these dreary days to fill your time. It's obvious what I'm doing - I'm running my mouth through my fingertips.

Your observations concerning my hallway measuring experiment are probably valid. I think that my people probably did a bit worse with a measuring wheel than they might have with a bike. I see the deviation from the straight line as having two components. The first is the inevitable wiggle or weave that occurs when we try to follow a line. This is a high-frequency low-amplitude wave. It is superimposed on a high-amplitude low-frequency wave, the "long-radius arc" effect that you wrote about. I think that we're doing fine in covering the first kind of wiggle - we probably don't wiggle too much different during calibration than we do when measuring. It's our inability to hew to the line that makes us come out short. The diagram below is what I mean:

FROM MN, DECEMBER 1982



Since runners don't necessarily follow the SPR it may well be that in measuring short one really measures properly. However, since the route that runners will run is not a clearly defined one, I think that the SPR is the way to go.

I also agree with your observation that a measurement that achieves good agreement between two riders on two bikes is better than when one rider does both measurements. I don't think it would make life easier for us if this were to be a requirement though. Two measurements by the same good measurer are probably better than one by a good measurer and another by a beginner.

Running tracks are measured by steel-taping. I understand that they may not be short. OK. Does anybody know how long they may be? If measured to our present road racing standard a 400 meter oval could be .4 meters long. Does anybody out there have any dope on this?

This guy wrote to a columnist, and several of his remarks struck a chord.

Kevin Lucas reports that he's well on the way to becoming a first-rate measurer.

Dear Mr. [REDACTED]

It is funny how one letter can alter a person's life forever. I wrote you suggesting that measuring road courses by bicycle is probably the least accurate but most practical method. Well, shit hit the fan. You must have sent copies all over the country because I have been getting aggressive letters and calls from everywhere. This has all revealed a previously unrecognized network called the Measurement Mafia. It had gotten so bad that I hid in the closet when the doorbell rang and cringed at every phone call. The government was going to put me in a witness protection. I have been moved. Mail sent to me at the below address will be returned unopened.

I thought I was finally in the clear, but then Dan Millet and Kevin Lucas cracked through and forced me to measure two courses with them. Well, they were truly nice guys. I had a great time and enjoyed participating in the operation. The best thing resulting from this affair has been getting a more sensible perspective of the problem from Dan and Kevin.

Given the definition of a course length as the shortest possible distance, a bicycle is the only practical method. As a result, the Mafia has developed a rigorous procedure to take out as much of the inherent inaccuracy as possible. My letter struck quite a raw nerve, especially from Don Peter Riegel, the apparent capo de capos. Maybe where there is smoke there is fire. I don't know, but I hope to completely dispel my initial skepticism. I was very happy with what I saw last Sunday, and I hope to participate more in the future. So in a way, thanks very much for spreading my name around.

Sincerely,

I won't spread his name around any further.

(13)

BOB PEVRIL  
RECOMMENDED  
THIS PAINT  
A YEAR OR  
AGO - SEE

I ORDERED A CASE (12) OF  
WHITE. WILL REPORT. PLZ  
\$26 per case (12 cans)

WRITE TO: FOX VALLEY SYSTEMS  
640 INDUSTRIAL DR.  
CARY, IL 60013-9588

EVRL  
EMDED  
AINT  
AR OR TWO  
- SEE OLD MN.

(14)

Kiegel 3354 Kirkham Rd  
Columbus OH 43221

4  
12  
86

Pete-

I notice in your book you warn  
course measurers to hold their paint  
cans upright. I am surprised that  
you assume the existence of only  
the inefficient, sloppy, expensive  
aerosol paint.

I have used the fluorescent  
Tri-g-a-cap paint by Fox Valley  
for 3 years and find it 100%  
better - 1. Hold upside down.

2. No need to remove cap 3. Bright  
paint 4. The whole can is paint.

I enclose their information and  
think you'll find this product  
excellent for the specialized  
use we have. You'll note the  
case cost is also very reasonable.  
Let me know what you think.

By the way, what's with the  
Lake County marathon certificate?  
Any problems?

Chris Gray - 2906 N. Mildred 60657

CHICAGO, IL

# Ouellettes Gang Marathon

## Dad, 4 Sons Swell Entry List to 179

There will be 179 runners assembled in the Hopkinton High School gym tomorrow morning awaiting the start of the B.A.A. Marathon, but every time a contender turns around he is likely to meet one of the Ouelletts from Ashland, Me.

The Ouelletts will have a five-man representation, headed by Daddy Sam, who ran back in 1928.

### HAWAIIAN STAR JOINS FOREIGN ENTRY

Sam and his four sons—Paul, Aurele, Eugene and Edward—will answer George V. Brown Jr.'s starting gun at noon at the new takeoff spot near the Hopkinton Community Center.

The Ouelletts are coming here with a fine running reputation too. They took the first four places in the Maine 25-kilometer championship. Edward was the winner, followed by Aurele, Pop and Paul.

Distance should not be a serious factor with the family group from Maine's Aroostook County because the Ouelletts have been champions in the rugged sport of ski marathoning.

The formidable foreign entry was strengthened yesterday when Yotuki Chinen of Hawaii declared himself in. Chinen will join three Japanese, three Koreans, two Finns and two Mexicans in the bid to run the string of foreign triumphs to 12 straight. John A. Kelley (the elder) in 1945 was the last home bred to lead the pack to the Excelsior Street finish line.



(AP Photo)  
**MAKING IT 26 MILES, 385 YARDS,** Police Chief Francis X. Bowker of Hopkinton paints new starting line for tomorrow's B. A. A. Marathon. Checking the chief are Kingsley Browne, B. A. A. official who supervised measuring of course and found it short, and Dave White of South Lee, N. H., head of research group.

←  
2-wheel  
measuring  
device

15

from Wayne Nicoll