

# Hiawatha Designs an Experiment

## Maurice G. Kendall

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Hiawatha, mighty hunter  
He could shoot ten arrows upwards  
Shoot them with such strength and swiftness  
That the last had left the bowstring  
Ere the first to earth descended.  
This was commonly regarded  
As a feat of skill and cunning.

One or two sarcastic spirits  
Pointed out to him, however,  
That it might be much more useful  
If he sometimes hit the target.  
Why not shoot a little straighter  
And employ a smaller sample.

Hiawatha, who at college  
Majored in applied statistics  
Consequently felt entitled  
To instruct his fellow men on  
Any subject whatsoever,  
Waxed exceedingly indignant,  
Talked about the law of error,  
Talked about truncated normals,  
Talked of loss of information  
Talked about his lack of bias  
Pointed out that in the long run  
Independent observations  
Even though they missed the target  
Had an average point of impact  
Very near the spot he aimed at  
(With the possible exception  
Of a set of measure zero.)

This, they said, was rather doubtful.  
Anyway, it didn't matter  
What resulted in the long run.  
Either he must hit the target  
Much more often than at present  
Or himself would have to pay for  
All the arrows that he wasted.

Hiawatha, in a temper  
Quoted parts of R. A. Fisher  
Quoted Yates and quoted Finney  
Quoted yards of Oscar Kempthorne  
Quoted reams of Cox and Cochran  
Quoted Anderson and Bancroft  
Practically in extenso  
Trying to impress upon them  
That what actually mattered  
Was to estimate the error.

One or two of them admitted  
Such a thing might have its uses  
Still, they said, he might do better  
If he shot a little straighter.

Hiawatha, to convince them  
Organized a shooting content  
Laid out in the proper manner  
Of designs experimental  
Recommended in the textbooks

(Mainly used for tasting tea, but  
Sometimes used in other cases)  
Randomized his shooting order  
In factorial arrangements  
Used in the Theory of Galois  
Field of ideal polynomials  
Got a nicely balanced layout  
And successfully confounded  
Second-order interactions.

All the other tribal marksmen  
Ignorant, benighted creatures,  
Of experimental set-ups  
Spent their time of preparation  
Putting in a lot of practice  
Merely shooting at a target.

Thus it happened in the content  
That their scores were most impressive  
With one solitary exception  
This (I hate to have to say it)  
Was the score of Hiawatha,  
Who, as usual, shot his arrows  
Shot them with great strength and swiftness  
Managing to be unbiased  
Not, however, with his salvo  
Managing to hit the target.

There, they said to Hiawatha,  
That is what we all expected.

Hiawatha, nothing daunted,  
Called for pen and called for paper  
Did analyses of variance  
Finally produced the figures  
Showing beyond peradventure  
Everybody else was biased  
And the variance components  
Did not differ from each other  
Or from Hiawatha's  
(This last point, one should acknowledge  
Might have been much more convincing  
If he hadn't been compelled to  
Estimate his own component  
From experimental plots in  
Which the values all were missing.  
Still, they didn't understand it  
So they couldn't raise objections,  
This is what so often happens,  
With analyses of variance.)

All the same, his fellow tribesmen  
Ignorant, benighted heathens,  
Took away his bow and arrows,  
Said that though my Hiawatha  
Was a brilliant statistician  
He was useless as a bowman,  
As for variance components  
Several of the more outspoken  
Made primeval observations  
Hurtful to the finer feelings  
Even of a statistician.

In a corner of the forest  
Dwells alone my Hiawatha  
Permanently cogitating  
On the normal law of error  
Wondering in idle moments  
Whether an increased precision  
Might perhaps be rather better  
Even at the risk of bias  
If thereby one, now and then, could  
Register on the target.

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The author, the late Sir Maurice George Kendall was a highly respected British statistician. Knighted for his many contributions, he was also President of the Royal Statistical Society, Honorary President of the International Statistical Institute, and a Fellow of the American Statistical Association among his many honors and associations. This poem was published in *The American Statistician* 13:5, December, 1959, and is reprinted here with the permission of that journal.