ACCURACY OF PESOLA SPRING SCALES AND HARVARD TRIP BALANCES

By Emil J. Berger, Jr.

When I recently obtained from Basel, Switzerland, some Pesola spring scales, I wanted to find out just how accurate they were.

Using National Bureau of Standards Class C weights of 10± .007 gms., 20± .01 gms., and 30± .02 gms., I made six weighings in random order for each weight. The results were astonishingly good.

For the true weight of 10 gms., the mean reading on the 30 gm. Pesola balance was 10.07 gms. with a standard deviation of .05 gms. For a true weight of 20 gms., the mean reading was 20.18 with a .075 gm. standard deviation. The mean reading for the 30 gm. true weight was 30.10 with a standard deviation of .126 gms. All readings were taken using the same edges of the fiducial lines and estimating to 0.2 gms.

68.3% of the weight readings of a true 30-gram bird will fall between 29.97 and 30.23 gms.

The 20 gram weight was hung on the balance and left stationary for 5½ hours. The initial reading was 20.1 grams. After blowing on the weight to "dither" the instrument and eliminate any possible effects of friction, the pointer came to rest at 20.2 gms. This indicates that "creep" due to long term loading of the spring is not a problem.

Previous to this, I had been using a Harvard Trip Double Beam Balance, two kilogram capacity, manufactured by the Ohaus Scale Corp., of Union, N.J., for taking bird weights. This balance has two calibrated beams with sliding rider weights, making it possible to read directly from the scales up to 210 gms., in 0.1 gm. increments, without putting weights on the balance pan.

When I put the 10 and 20 gm. weights on one balance pan, and the 30 gm. weight on the other, the swing of the needle was equal on both sides of the zero point, indicating good balance. High pivot friction was not evident.

Taking six random readings for each weight as before, and reading weights from the instrument scales, the 10 gm. weight gave a mean of 10.02 gms. and a standard deviation of .041 gms; the 20 gm. weight mean reading was 19.83 gms., standard deviation of .163 gms; and the 30 gm. weight gave a mean value of 29.83 gms. with a standard deviation of .121 gms.

This information made me sorry I had never made this check before, since I had been using this balance for four years and had never realized

that the sliding scale of the balance was of incorrect length, producing this instrument error. I had confused sensitivity with accuracy! All weights taken on this balance are lower than their true value. For a bird with a true weight of 30 gms., 68.3% of the readings of his weight taken on this balance will lie between 29.71 and 29.95 gms.

The accuracies I found are reasonable, if you consider that the weight of a 30 gm. bird probably varies one-half gram or more depending on the state of his digestive tract.

How many of us have ever checked the accuracy of the instruments we use? It would be better not to find that years of supposedly careful work were useless because of some unknown instrument errors more serious than those which gave rise to these thoughts. How significant are your measurements?

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ARE YOU A SUSTAINING MEMBER? If not, please consider carefully whether you could become one. EBBA needs more Sustaining Members ... Our Treasurer reports that costs continue to rise, and a glance at the Treasurer's Report in this issue reveals that had it not been for an unexpected $500 payment by the Net Committee, our balance would have been considerably less than last year's. Furthermore, the Treasurer reports that the number of Sustaining Members is decreasing. A few have become Life Members, but more have simply reduced their dues payment to the $4 Active Membership.

It is our aim as an association to make it as easy as possible for people to become members - mainly by keeping the dues as low as they can reasonably be - and yet constantly to improve our publication and our other activities. In a time of increasing costs this is a financial paradox which is resolved to a large extent by Sustaining Members. The situation is made more acute by the increasing scarcity of new members and resignations of some old ones - as a result of the Banding Office's stricter licensing policies.

We ask that each Active Member search his fiscal soul with a view to giving a bit of extra support to our association, to helping its efforts for improvement...and to becoming a Sustaining Member.