

New Zealand Bird Notes

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MEASUREMENTS OF BIRDS.

(By L. Gurr, Department of Zoology, University of Otago.)

This paper on the measurements of birds has been written with the hope that it may stimulate the interest of the members of the society in this aspect of ornithology, the taxonomic import of which is obvious. Further, it is hoped that by the publication of this standard set of measurements, which must form the basis of any work of this type, whatever bird is studied, some degree of uniformity will be obtained in the measurements taken by the various workers in this field in New Zealand. Unless all workers use the same methods comparisons of measurements are useless and can only lead to erroneous conclusions being formed.

All methods given are those recommended by Baldwin, Oberholser and Worley, whose excellent book on this subject should be referred to by anyone requiring to take measurements of special structures or types

not dealt with in this paper. Space does not permit the inclusion of any more measurements than those which are the most frequently used.

The most essential instruments required are a pair of dividers and a ruler graduated to millimeters and fractions of millimeters. For beak and leg measurements, dividers should always be used; for those of wing and tail, dividers or ruler may be used according to individual preferences; total length and extent of wings are best measured with a ruler. If obtainable, a pair of sharp pointed calipers graduated to tenths of a millimeter, will be found to be a refinement and useful for measurements of the bill and smaller parts.

Structures that are too long to be measured with dividers or ruler, i.e., extent of wings, can easily be dealt with by marking off the points reached by the extremities of the structure on the floor or bench and measuring the distance between these points. Whenever dividers are used, care must be exercised to see that the point does not slip past the actual mark required.

In all measurements of feathers, except those of primaries and secondaries, the shaft if bent should be straightened and that measurement given.

To avoid missing out a measurement it is as well to measure the structures always in the same sequence, i.e., start at the head of the bird and work backwards—beak, wing, leg and tail, or follow the sequence in which you intend setting out your results. The most general sequence of stating measurements and that which is recommended for uniformity is:—(1) Total length ("length"); (2) extent of wings ("extent"); (3) length of closed wings ("wing"); (4) length of tail ("tail"); (5) length of exposed culmen ("exposed culmen"); (6) length of tarsus ("tarsus"); (7) length of middle toe ("middle toe"). Here feathered structures are given first, and "soft parts" next. For the sake of completeness the writer suggests that total culmen, width of bill at base, height of bill at base and length of middle claw be included where possible.

Should it be found necessary to deviate from the standard way of making any measurement the author should adequately state his methods, indeed it is advisable always to mention the methods used, even if they are those generally accepted. Too frequently, papers have been published on this subject without mention of the methods used to arrive at the results obtained, with consequent total loss of value for purposes of comparison with the results of other workers.

Finally, it cannot be stressed too much that the greater the number of individuals of a species measured, the greater the value of the work. The range and variation can be shown, and if the results are submitted to statistical analysis the significance of the results will be revealed. The results may then be used (1) for purposes of generic and even family characterisations to indicate the differences and similarities between such groups; (2) to show differences between species and between sub-species; and (3) to bring out the many kinds of variation within the limits of species and sub-species. Some measurements are suitable for all three of these purposes; others, by their nature, for only one.

The writer wishes to thank Professor B. J. Marples, of the University of Otago, for reading this paper in manuscript, and for helpful advice and criticism.

Reference.

Baldwin, S. Prentiss; Oberholser, Harry C., and Worley, Leonard G.: "Measurements of Birds." Scientific Publications of the Cleveland Museum of Natural History, vol. II., pp. i-ix; 1-165; figs 1-151, Oct., 1931. Cleveland, Ohio.

TOTAL LENGTH WITH FEATHERS.

Measured from the tip of the bill to the tip of the tail, the bird, thoroughly relaxed, lying flat on its back along a ruler, with the head bent dorsally so that the bill is approximately parallel with the ruler, and without stretching the neck beyond a natural position.

WING MEASUREMENTS.

Extent of Wings with Feathers.—The distance between the tips of the outstretched wings, measured from the farthest primary tip on one side to the farthest primary tip on the other, by laying the bird, thoroughly relaxed, flat on its back, and, by grasping each wing at the carpal joint, spreading the wings out along a ruler as far as possible without injuring the bird or flattening the wing quills.

Length of Closed Wings. (Fig. 6).—This is the wing measurement most commonly used, and is generally called "wing" or "length of wing" in descriptions of birds. It is preferably taken with dividers in a straight line from the farthest anterior point on the anterior edge of the wrist joint to the tip of the longest primary, without attempting to flatten out the curve of this feather; and it is therefore the chord of the closed (folded) wing. In taking this measurement, if the bird is held in the left hand dorsal surface up with the neck passing between the first and second fingers it is easy to place the nail of the index finger in the joint of the carpal flexure, and thus have a solid object to hold that point of the dividers against at the correct spot.

TAIL MEASUREMENTS.

Length of Tail.—Measured with dividers, one point being inserted between the two middle rectrices at the place where their bases emerge from the skin, and the other point of the dividers brought into contact with the tip of the longest tail feather where the tail is closed. If the longest feathers are bent, curved, or curled, they should be straightened for measuring. Note should be made if the tail-feathers show abrasion, since in such case the tips may be worn off and the length thereby considerably changed.

BEAK MEASUREMENTS.

Length of Exposed Culmen. (Fig. 1).—Measured from the point at which the feathers of the forehead in their natural position cease to hide the culmen (point B, fig. 1) in a straight line to the tip of the culmen (point A, fig. 1). This is, therefore, really the chord of the exposed culmen (the length of the straight line between point A and point B, fig. 1). This measurement is easy to take and has, besides, the advantage that its posterior point of departure is the same as that at which it is convenient to measure the height and width of the bill.

Length of Total Culmen. (Fig. 1).—Measured from that point where the integument of the forehead of the bird meets the horny covering of the bill (point C, fig. 1) in a straight line to the tip of the bill (point A, fig. 1), this is the chord of the total culmen. In birds with a cere the posterior limit for this measurement should be the point where the feathers begin, or the anterior end of the frontal bones of the skull on the forehead.

Height of Bill at Base. (Fig. 1).—Measured from the base of the exposed culmen (which is usually the highest point of the culmen) (point B, fig. 1) to the lower edge of the ramus of the mandible below, at the point that is antero-posteriorly opposite (point D, fig. 1) which would almost always be the nearest point.

Width of Bill at Base. (Fig. 2).—This measurement should be taken directly below the base of the exposed culmen, and is the shortest distance from the cutting edge (commissure) on the one side to the cutting edge on the opposite side.

LEG MEASUREMENTS.

Length of Tarsus (tarso-metatarsus). (Fig. 3).—The length of the "tarsus" is measured from the exact middle point of the joint between the tibia and the metatarsus **behind**, to the lower edge of the lowest undivided scute on the **front** of the junction of the metatarsus with the base of the middle toe, or to the middle of this articulation when such is discernible. This measurement is therefore the diagonal of the tarsus. Some workers prefer to measure the tarsus wholly on the **anterior** side, but care should be taken in determining the proper point for insertion of the dividers at the upper (anterior) end of the tarsus. However, whichever method is used it should be clearly stated in the text.

FOOT MEASUREMENTS.

Measurement of all toes and all claws are sometimes taken, but that of the middle toe is that most generally referred to. Care should be taken in all measurements of the toes to make sure that the toe is straight, as otherwise the results will be in error. It is often advisable to place the foot in a standing position on a flat surface to ensure the straightness of the toe whilst measuring. In all cases the measurement of the length of the claw is the chord of the claw.

Length of the Middle Toe. (Fig. 4).—The length of the middle (third) toe is measured on its dorsal surface, with dividers, from its very base at the middle of the metatarsal joint, where it is discernible, otherwise from the lower edge of the lowest entire tarsal scute, to its distal and where its integument ends on the base of the claw, and exclusive of the claw.

Length of Middle Claw. (Fig. 5).—The length of the claw of the middle toe is measured from the point on its upper surface where the skin of the toe impinges on the base of the claw, in a straight line to the tip. This is, therefore, the chord of the claw.

Length of Middle Toe and Claw.—The middle toe together with the claw may be measured with dividers, from the base of the toe on its upper surface in a straight line to the tip of the claw. (Points of insertion for dividers same as those illustrated in figs. 4 and 5.)

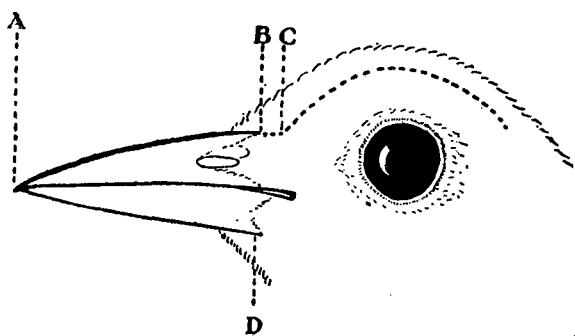


Fig 1

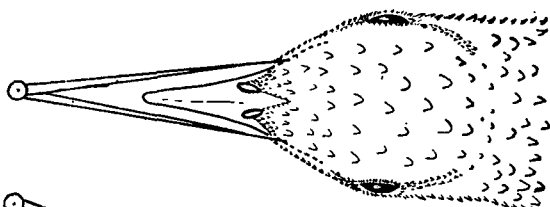


Fig 2

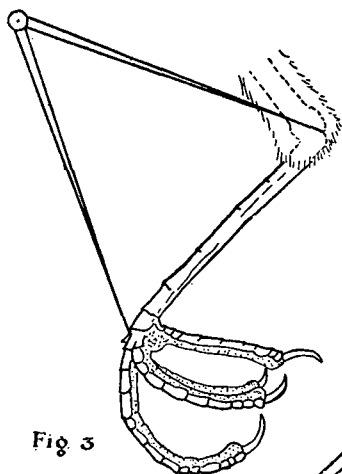


Fig 3

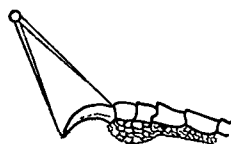


Fig 5

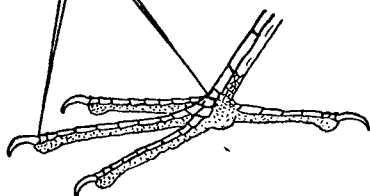


Fig 4

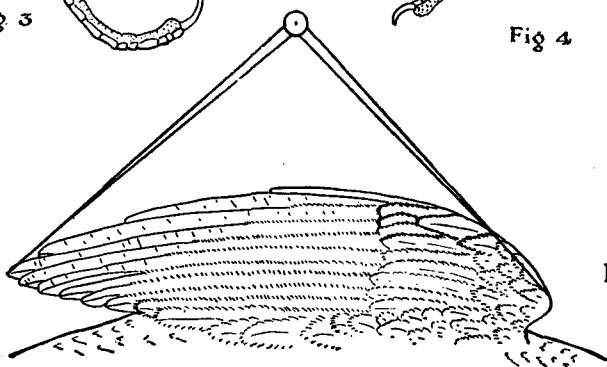


Fig 6