

- NORDBERG, S. 1950. Researches on the bird fauna of the marine zone in the Åland archipelago. *Acta Zool. Fenn.* 63:1—62.
- NORDSTRÖM, G. 1963. Einige Ergebnisse der Vogelberingung in Finnland in den Jahren 1913—1962. *Ornis Fenn.* 40:81—124.
- NØRREVANG, A. 1960. Nogle iakttagelser over trækende terners opførsel. *Dansk Ornitohol. For. Tidsskr.* 54:125—127.
- 1964. Fåglarnas flyttningar och orientering. In Blaedel, N., Nordens fåglar i färg, VI, pp. 232—261. Malmö.
- ONNO, S. 1966. Faunistical and ecological researches. In Kumari, E. (ed.): Ornithological researches in Estonia. — Tallinn.
- PAAVOLAINEN, E.-P. 1950. Piirteitä Porvoon läntisen saaristoalueen linnustosta. *Suomen Riista* 5:28—59.
- PALMER, R. 1941. A behavior study of the Common Tern (*Sterna hirundo hirundo* L.). *Proc. Bost. Soc. Nat. Hist.* 42, No. 1.
- SANDMAN, I. 1892. Fågelfaunan på Karlö och kringliggande skär. *Medd. Soc. F. Fl. Fenn.* 17:187—272.
- STUART BAKER, E. C. 1929. Notes on the birds of Hailuoto (Karlö) 65° lat. Finland. *Ornis Fenn.* 6:61—66.
- TAXELL, C. G. 1934. Fågelfaunan på Valsörarna i Vasa skärgård. *Ornis Fenn.* 11:5—13.
- TENOVUO, R. 1966. Veränderungen in der Vogelfauna von Kökar (Åland, Südwestfinnland) in den Jahren 1925—1961. *Ann. Zool. Fenn.* 3:5—19.
- VOIPIO, P. 1954. Beobachtungen über die Silbermöwe, *Larus argentatus* Pont., am Gross-Saimaa und ihre Beziehungen zu den anderen Möwenvögel. *Ornis Fenn.* 31: 57—80.
- YTREBERG, N.-J. 1956. Contribution to the breeding biology of the Black-headed Gull (*Larus ridibundus* L.) in Norway. Nest, eggs and incubation. *Nytt Mag. Zool.* vol. 4:5—106.

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WING LENGTH OF LAPWING (*VANELLUS VANELLUS*) BEFORE AND AFTER SKINNING, WITH REMARKS ON MEASURING METHODS

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In spring 1966 a severe cold period occurred in northern Europe. During this period thousands of Lapwings succumbed in Finland (VEPSÄLÄINEN 1968). I had an opportunity to measure the wing lengths of 11 Lapwings sent to the Zoological Museum of the University of Helsinki. The first measures were taken in spring 1966 from birds that had died recently, and the second ones in autumn 1966 from the same birds now skinned.

The 'minimum chord' of the right wing was measured with a ruler. The median coverts of the folded wing were pressed gently, with the thumb, against the ruler, and the length of the wing was read from the carpal joint to the tip

of the longest primary; the normal natural curvature of the primaries was not straightened. The bill was measured with dividers from the tip to the feathering of the forehead (for methods see CORNWALLIS & SMITH 1963).

Results

The results of the measurements are shown in Table 1. The measures of the same individuals taken before and after skinning varied considerably. The greatest reduction — compared to the measurements of fresh individuals — was 12 mm; in one case the measures were the same. Hence the shortening of the wing was very uneven. The average re-

TABLE 1. The wing and bill lengths (in mm) of 11 Lapwings found dead in spring 1966 in Finland. The number refers to the collections of the Zoological Museum of the University of Helsinki.

TAULUKKO 1. Yhdentoista keväällä 1966 kuolleena löytyneen töyhtöhyypän siiven ja nokan pituus (mm). Numero viittaa Helsingin Yliopiston Eläinmuseon kokoelmiin.

Sex	Finding data		Fresh wing	Wing of skin	Bill	No.
Sukupu.	Löytötiedot		Tuore siipi	Naban siipi	Nokka	N:o
♂	18.4.	Loviisa	216	214	25.5	14518
♂	14.4.	Helsinki	218	215	22.5	14516
♂	14.4.	Helsinki	224	221	24.0	14517
♂	16.4.	Tammisaari	226	222	23.0	14515
♂	15.4.	Espoo	227	218	25.0	14514
♀	15.4.	Espoo	219	214	22.0	14522
♀	17.4.	Turku	219	218	24.0	14526
♀	11.4.	Tammisaari	220	215	25.0	14523
♀	14.4.	Helsinki	220	220	23.0	14525
♀	18.4.	Helsinki	221	215	24.0	14527
♀	14.4.	Helsinki	223	211	23.0	14524

duction was 4.5 mm or 2 %. The differences in the wing measurements taken before and after skinning are statistically significant:

$$\bar{x}_{\text{fresh}} = 221.2 \pm 1.1 \text{ mm}$$

$$\bar{x}_{\text{skin}} = 216.6 \pm 1.1 \text{ mm}$$

$$t = 3.1, \text{ d.f. } 20, P < .01$$

The skinned Lapwings were measured twice during successive days, and the results were consistent in the ranges of ± 1 mm.

Many factors can cause a wing to shorten when conserved. In the Lapwings examined the following was noted: 1. The flesh surrounding the carpalia was partly removed during skinning, and the rest shrunk when the skin was dried — the shrinkage was particularly large as arsenic was used. 2. During the skinning the wing was pressed so tight against the body that the primaries were abnormally curved and hence shortenend. 3. The abnormal curving of the primaries was further

increased when skins were kept in overcrowded boxes.

Discussion

The value of skinned birds is indisputable. Without data obtained from skins BERGMANN and ALLEN would not have written their 'Rules'. However, it is difficult to obtain useful data for population study of a bird species or for studying the possible subspecies of a certain species. The handbooks seldom give the exact measurements of the species, usually only ranges of measures are given, and, mostly notes of the circumstances in which the birds were measured are lacking — skinned or alive, or possibly both. The capturing locality of the measured birds is seldom indicated; the data can be from an entirely different geographical area than what the handbook is considering.

As an example of the difficulties in applying measurements given in handbooks, the data of the Lapwings measur-

ed in this study (*see* Table 1) can be compared to those in the literature. DEMENT'EV *et al.* (1951) gives the following lengths for the wing: males $\bar{x} = 225$ mm (63 individuals), and females $\bar{x} = 226.5$ mm (31). According to this, Finnish and Russian Lapwings seem to differ in wing lengths. Unfortunately the measuring techniques used are not clearly given in the cited literature and consequently conclusions cannot be drawn from the material on hand; thus the value of an information is greatly reduced.

Hence, when taking measurements it is important to state the following: 1. Measuring technique used, 2. The condition of the birds when measured, 3. Capturing locality, 4. Numbers of measured individuals, 5. Range measurements, means and standard errors.

The importance of using the correct techniques when measuring living birds cannot be sufficiently emphasized. Only with *strict field-taxonomical methods* can we obtain reliable material, concerning measurements, for new taxonomical works as population and subspecies studies, growth-rate and moult studies, etc. The Scientific Advisory Committee of the British Trust for Ornithology has at a meeting on 11th July 1959 recommended measuring methods that can be obtained from eg. CORNWALLIS & SMITH (1963). These methods should be known in every country where field-taxonomical work is undertaken.

Summary

Wing lengths of 11 Lapwings found dead in spring 1966 in Finland were measured before and after skinning. The deviations in obtained individual values are statistically significant. The reasons for the shrinkage in the skinned bird wings are given. Further, the importance of uniform field-taxonomical methods is emphasized.

Selostus: Töyhtöhyypän siiven mitoista ennen ja jälkeen nahoituksen.

Keväällä 1966 mittasin takatalven aikana kuolleista töyhtöhyypistä 11 yksilöä tuoreeltaan, so. heti kun linnut oli saatu Helsingin Yliopiston Eläinmuseoon, sekä uudelleen kahdesti nahoitettua yksilöistä syksyllä 1966. Tulokset on esitetty taulukossa 1. Siiven mitta-arvot olivat pienentyneet nahoituksessa keskimäärin 4.5 mm eli 2 %. Lyheneminen oli eri yksilöissä hyvin epätasaista.

Kirjoituksessa tarkastellaan käsikirjoista saatavien mittojen käyttömahdollisuuksia ja todetaan, että arvokkaasta mitta-aineistosta suuri osa on käyttökelvotonta puutteellisesti ilmoitettujen mittaustietojen — mittojen maantieteellinen alkuperä, mitattujen yksilöiden kunto (elävä vai nahka) ja mittojen ääri- ja keskiarvot — takia. Siksi suositellaan, että mittoja ilmoitettaessa tilastollista käsittelyä ja muuhun aineistoon vertailua helpotettaisiin antamalla edellä lueteltujen mittaustietojen lisäksi myös keskiarvon keskivirhe, jos kaikkia mittausarvoja ei tilan puutteen takia (esim. käsikirjassa) voida ilmoittaa. Jotta eri henkilöiden suorittamat mittaukset olisivat vertailukelpoisia, olisi mittauksissa noudatettava yhtenäistä käytäntöä. Maastomittauksiin suositellaan laajalti käytettyä menetelmää, mikä esitetään esim. CORNWALLIS & SMITHIN (1963) oppaassa (ks. kirjallisuusluettelo).

References

- CORNWALLIS, R. K. & SMITH, A. E. 1963. The bird in the hand. 2nd ed. — Oxford.
 DEMENT'EV, G. P., GLADKOV, N. A. & SPANGENBERG, E. P. 1961. Ptitsi Sovjetskojo Sojusa. Tom. III. — Moskva.
 VEPSÄLÄINEN, K. 1968. The effect of the cold spring 1966 upon the Lapwing (*Vanellus vanellus*) in Finland. *Ornis Fenn.* 45: 33—47.

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