Peters, D. Purchase, I. C. R. Rowley, E. Slater, G. F. van Tets, S. J. Wilson.

NSW.—R. K. Carruthers, Mrs C. C. Crowe, G. Dibley, H. J. de S. Disney, R. B. Doyle, Mrs N. E. Gadsden, S. G. Lane, R. L. Mote, Miss O. Nock, Miss D. M. O'Grady, Miss G. Y. O'Grady, R. L. Pearce, M. T. Rowe, Miss D. Stenhouse, A. Stokes, Miss M. Talbot.

NT.—Mrs C. M. Cox, S. A. Parker.

Q.—W. Horton, N. Jack.

TAS.—Mrs B. N. Angel, R. H. Green, Miss C. H. Mosey, D. G. Thomas.

WA.—S. J. J. F. Davies, J. Dell, M. G. Ridpath, F. N. Robinson, D. A. Saunders, A. G. Stevenson.

VIC.—P. Balmford, Mrs R. A. Balmford, B. A. Blair, Mrs B. Blair, W. A. Davis, Mrs W. Denney, D. F. Dorward, T. I. Gellibrand, F. E. Jones, J. Jones, Mrs W. G. Jones, Mrs T. Kloot, Mrs E. M. McCulloch, A. R. McEvey, Miss D. Moroney, F. T. Morris, Mrs P. N. Reilly, Mrs G. H. Vasey, Miss I. Watson, N. Wettenhall.

PAPUA.—L. W. C. Filewood.

PRESIDENTIAL ADDRESS

Part I—'Art in Ornithology' (see p. 251)
Part II—'Australasian Avian Osteology'

Under this heading I attempt to discuss briefly some historical aspects of osteology as a field of study in ornithology, to indicate its current trends, and to suggest Australian and New Zealand opportunities.

Most ornithologists know that there has been a renaissance in the study of osteology and anatomy during the last ten years. To understand this better let us look at the osteology of the past. Though there are many references that could be used, I draw attention particularly to three: *The Proper Goal of Comparative Anatomy* by D. Dwight Davis, and *The Use of Adaptive Characters in Avian Classification* and *Evolution and Phylogeny in Morphologically Uniform Groups* by Walter Bock which sum up the situation ably. In speaking of the past I borrow freely from these authors.

The idea of an archetype plan, an original model upon which the structure of vertebrates was based, was a central theme in pre-Darwinian morphology, especially during the 18th century. It arose from the same mould of thought as that which produced the concept of the type-specimen in systematics, the concept which saw the species as statically created and the type-specimen as typical of it. Of comparative anatomy Bock remarks 'During the period, roughly 1650-1850, in which the foundations for comparative anatomy and for taxonomy were being established, homology was based upon the ideas of transcendentalism which stems mainly from Kantianism. The unity of nature was the guiding principle; groups of organisms were believed to be constructed (= created) on the pattern given by the ideal type for that group. Belief in typology—that all members of a natural group of objects are patterned after the ideal type and that the observed variations between members of the group are non-essential—is a very old one and goes back to the teachings of Plato'.

In passing, mention should be made of the outstanding work of the Dutch anatomist and osteologist Volcher Coiter (1534-1576) which showed a close understanding of the bird skeleton, and reference made also to the early work of Pierre Belon (1517?-1564).

Davis draws attention to the dominant part played in general comparative anatomy during the second half of the 19th century by the German anatomist Gegenbaur who through detailed studies established evidence of a common plan existing in vertebrates, although he professed to be studying phylogeny, the history of the structural elements of the body. As Davis points out, the Gegenbaurian school, whose accomplishments were considerable, were still based, in their concept, 'in the old idealistic natural philosophy'. 'Their concept of the common structural plan differs little from the "common ideal plan" of the natural philosopers.' In other words, following the acceptance of the theory of evolution, the search for

the common ancestor replaced the earlier search for the type or archetype.

In ornithological osteology of the later 19th and early 20th centuries there are the names with which we are most familiar; Parker, Huxley, Garrod, Forbes, Furbinger, Owen, Beddard, Pycraft and others. The kind of osteological work they were associated with centred round description and the seeking of evidence to reveal evolutionary descent, common ancestry and common structure. Again Bock remarks 'Owen and all other comparative anatomists of his time were only concerned in similarity between structures because of their interest in proving the concept of a unity in nature; this concern is directly reflected in his concepts of homology and analogy which were associated only with similarity between structures'. Hence comparative anatomy from being a means of searching for the ancestral type had become a means of searching for evidence of descent from a common ancestor. This is not really very different, and naturally enough it placed emphasis upon similarity.

It should be noted also that birds, unlike sharks, did not lend themselves to illustrating an evolutionary series, e.g. the shark to man series. But they did provide scope for taxonomy on an osteological basis. This was still the period of describing species. Osteology was a taxonomic tool assisting in the huge task of naming and classifying birds. If we look at the study of the osteology of Australian birds we find, understandably, that it was part of this pattern and that it has been carried out chiefly by overseas workers. Shufeldt studied *Cereopsis, Anthochaera, Nestor, Corcorax, Struthidea, Grallina,* and others, and published some of his results in *The Emu.* There were other early workers who touched on Australasian species, and in more recent times Leach, Oliver, and Condon, followed in the same tradition. In fossil studies traditional palaeornithological lines have been pursued in Australasian and Antarctic forms by De Vis, Marples, Miller, and Scarlett.

Reference to what has previously been published is a lasting necessity, and here may I draw attention to the splendid work Mrs. McCulloch has been doing for me at the National Musuem of Victoria in preparing a bibliography of literature dealing with the osteology of Australian birds and including reference to early papers. This work is still in progress. Also I have a contribution to this bibliography from Ron Scarlett of New Zealand, whom I thank not only for the effort that has produced it, but for his splendid example of co-operation to produce something Australasian.

Apart from the Ratites and some others, we have hardly begun to describe osteologically our distinctive avifauna of the Australian Region. Yet before we set out to do so, we ought to notice a change of emphasis that has occurred overseas. From Davis and Bock we have learned that comparative anatomy has in the past focused attention largely upon the common structural plan, and upon finding evidence of this; also that it did this, in part unconsciously, even after acceptance of the theory of evolution. Davis maintains that 'the phenomena of comparative anatomy are not the observed structure of vertebrates, but the observed *differences* between the structure of one vertebrate and another' and that the proper goal is that of exploring the variations within the plan; 'not the fact of change, but the mechanism whereby the changes were achieved'.

Bock follows the same line of thought when he urges the pursuit of what he calls 'evolutionary morphology' as an answer to this challenge. Evolutionary morphology in Bock's view is based not merely on comparison of forms, e.g. comparison of skulls or sterna or quadrates in different species, but upon comparison of these structures *and of* their biological roles, their functions as related to the ecology and daily life of the species, a comparison which seeks to discover the ways in which evolutionary change is related to change of function and to adaptation.

What can we do in Australasia? Here we have species, genera, and even families that are distinctive, yet wait to be osteologically described. Where can one find descriptions of skulls of *Falcunculus, Sphenostoma, or Psophodes,* to name three problem species? One is tempted to say that there is plenty of room for traditional descriptive osteology of Australasian forms, especially of species confined to this region. The evolutionary

morphologist's reply, however, is that if this is done, time and effort are wasted upon superficial comparisons which by virtue of being purely descriptive fail to give sufficient attention to significant features; that when the evolutionary morphologist later comes to study the implication of the difference between, say, the arrangement of the pterygoids, or the mandible shape, in particular genera, the previous descriptions will be useless to him because they will not have been functionally orientated.

I would like to suggest a compromise. I believe there is a great deal of room in Australasian osteology for three kinds of work.

1. Traditional descriptive and comparative osteology which compares species or related groups, as a means of supporting, or of questioning, current taxonomic classification, revealing in other words criteria previously overlooked for taxonomic use, e.g. a recent study of the general osteology of *Pedionomus* supports the current separation of *Pedionomus* at familial level. But such work should be done with a keen eye for aspects of importance to functional studies and attention drawn to them.
2. A further kind of research I suggest with misgivings about its apparent superficiality, but with some conviction for its potential usefulness. It is one dealing with the typical groups of the Australian Region, e.g. Meliphagidae, Climacteridae, *Gerygone,* Cracticidae, Artamidae. The need I have in mind is for studies which
   (a) take, for example, the cranium, and seek to find the 'average' or 'typical' cranium for the group, discuss it broadly, and list the species of the family or genus that differ from this 'norm', indicating the chief points of difference in order to reveal evidence of adaptation that has not been readily observed in the field and calls for investigation in terms of ecology and function.
   (b) select a narrower feature, e.g. palatines, pterygoids, sterno-coracoidal articulation, and survey a group in terms of that feature.
3. The third avenue, and no doubt the most significant, rewarding and difficult, is for special studies on evolutionary and functional morphology. It requires attention to myology as well as osteology. I am thinking of such problems as the morphology of the skull of the Shrike-Tit to show *why* it is so robust, *how* it has so become, and from what it is derived. Within this field too perhaps lie the unlimited special studies of selecting several bones forming a functional unit, e.g. the sterno-coracoidal articulation, or, as Bock has used, the mandibular articulation, and the tracing of the change and development of the unit through related groups. Or again investigation such as one on the functional and phylogenous features involved in the osteology of *Climacteris* and *Neositta.* Obviously one could continue to list the problems.

My main point is that in the Australian Region we are far behind the northern hemisphere even in traditional osteology and that before we have begun to catch up, new concepts have emerged which suggest that traditional methods are today less useful than was earlier the case. I believe we still need some such basic work however. That we do not yet know the elementary osteology of our birds has been shown by the discovery of the os prominens on the radius of our Ninox owls, and I believe we have a splendid opportunity to contribute in terms of both traditional and modern concepts to this fundamental field of ornithological research.

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