

Editorial preface

For the first time since the 20th Congress in Christchurch, New Zealand, in 1990, a substantially complete proceedings of an international ornithological congress are published here in hard copy. The present proceedings appear in two parts of the *Acta Zoologica Sinica*. Ten of twelve plenary lectures, including the two covering the origin of birds from the “Presidential Debate”, were published in 2004 in volume 50, pp. 880–1001. And here, the Official Report of the Congress, comprehensive summaries of all Round Table Discussions (RTDs), and all symposia that were submitted are published in full in a special supplement of the journal; two of the plenaries, submitted in shortened or abstract form and too late for inclusion in the 2004 issue, are added in the supplement.

For the first time since 1990, too, an Official Report is published in sufficient detail to provide a comprehensive record of the Congress and developments in the organizational machinery for future congresses, particularly in the International Ornithological Committee. Here I draw attention to a thorough report on the functioning of the Scientific Planning Committee for this Congress, and to a report from an *ad hoc* Finance Committee set up by incoming President Walter Bock at the the 22nd Congress in Durban to investigate the financial affairs of the International Ornithological Committee and the running of congresses with an eye to their future. It makes important recommendations concerning the need for fund raising and fund servicing by the IOCommittee, the rationalization of financial obligations between the IOCommittee and local organizing committees, and the development of an international federation of ornithological societies and ornithologists. Implementation of the recommendations is likely to prove crucial for the future development of international ornithological congresses.

Of the Round Table Discussions, numbered 1–24, only 20 were actually held. Reports of all those held are included here, one of them (RTD 18) separately in the Official Report of the Congress because it was produced by a Standing Committee, namely the Standing Committee on Ornithological Nomenclature. Under editorial instruction, RTDs were formatted in two sections, the first laying out the issues addressed, and the second detailing the outcomes of the meetings. Conservation-oriented issues are a recurring theme. No less than 13 of the RTDs focused on them, reflecting the emerging pre-eminence of bird conservation in ornithology today, driven by a declining bird fauna globally. Areas of conservation covered by the RTDs ranged from monitoring of environmental contamination and bird pests in agriculture to the impacts of threatening diseases, long-line fishing, loss of migratory stopover sites, the bird trade and climate change. Three were concerned with essentially Asian issues: the work of the threatened bird program and

networks of Birdlife International in Asia, the collapse of vulture populations in southern Asia, and shorebird conservation on the East Asia-Australasian flyway.

Regrettably only 36 of the 39 symposia presented were submitted for publication. Of these, 17 are complete, 9 one paper short, 6 two short, and 1 and 3 comprise one and two papers respectively. The range of subjects covered and the detail of information presented, impossible even 50 years ago, is awesome and reflects well the enormous advances made in all branches of ornithological science in that period, from gene expression, hormonal action and molecular systematics to satellite-tracking of migration, differential functioning of avian right and left eyes, the workings of the syrinx, flight energetics and integration of avian physiology with exogenous life cycle rhythms. Again conservation issues emerge pre-eminently, addressed directly in 11 symposia, of which 7 concern Asia at least in part. To enable ready perception of the content of the symposia, I present here a brief synopsis of each:

S01 — Perspectives in avian acoustic communication: in memory of Louis Baptista (5 papers) ranges from advances in understanding the modes of the remarkable wing sonations in the South American Pipridae to the discovery of triggering and signal mechanisms for vocalization in the brain, and for vocal learning, a phenomenon known in only three orders of birds: Psittaciformes, Apodiformes (Trochilidae) and Passeriformes.

S02 — The role of high quality individuals in populations of long-lived birds (3 papers) uses species studies on different seabird groups to bring out the importance of quality condition in pre-fledging young, particularly mass, for future survival, recruitment and breeding success.

S04 — Influence of birds on ecosystem structure and function (3 papers) deals with the environmental impact of land and freshwater birds at broad, ecosystem scales in different parts of the world (North America, Madagascar and New Zealand), particularly their keystone roles in food harvesting, pollination and seed dispersal.

S06 — Macroscopic and microscopic evolutionary perspectives on feathers (4 papers) focuses on the origin and evolutionary development of feathers from ontogenetic, paleontological and selectional perspectives. It addresses the functional structure of feathers, touches on the origin of flight, and, in its introduction and conclusion, draws attention to many still-unanswered questions.

S07 — Key issues in the conservation of sites important for birds (4 papers) reviews the establishment of Important Birds Areas (IBAs) in developing countries (Asia, Africa and Mexico), outlining procedures and processes at

local, national and international levels, recounting experiences and giving “take-home” messages.

S08 — Effects of global climate change on birds: evidence and predictions (5 papers) addresses the current impact of global climate change on timing of breeding and migration in land-, sea- and shore- birds, highlighting a developing phenological disjunction and focusing on the prediction of effects.

S09 — Photoperiodism: mechanisms and adaptations (2 papers) is concerned with physiological linkages, centering on the endocrine system, from the reception of photoperiodic signal to expression in reproduction and molt. It clarifies complexities in hormonal release and inhibition, and their control by the brain via the nervous system.

S10 — Demographic responses to habitat fragmentation: contrasts across space and time (3 papers) uses cross-continent comparisons to identify the population, not species or individual, as the unit most affected by habitat fragmentation, as manifested in lowered survival and breeding success. For remedial action, it stresses the importance of identifying the parameters that initiate causal mechanisms for demographic change.

S11 — Forest management and conservation of Galliformes (3 papers) comprises studies of the general conservation requirements of landfowl in east Asia (pheasants, quail) and central America (Cracidae), focusing on habitat protection and use of particular taxa as indicators of habitat quality.

S12 — Migration and conservation of cranes and storks (5 papers) explores the use of new technologies, notably satellite-tracking, to trace the migratory routes and stopover refuges of large migratory birds with accuracy not possible with conventional ringing. The potential for such technologies to provide information vital for conservation management — routes, times, rest points and physiological condition — is particularly clear in the paper by Berthold et al.

S13 — Mating patterns and ecology (2 papers) addresses the importance of the link between food availability, breeding synchrony and patterns of extra-pair mating outside the social pair, and illustrates trade-offs in the frequency of mate guarding against resource availability and habitat density.

S14 — Integrating mechanism and function in bird behavior: how hormones can help (3 papers) integrates hormonal action with physiological function and behavioral expression from the molecular level to the organismal, at one of the cutting edges in biological science. It presents evidence that sex steroids can be produced in tissues outside the sex glands, enabling expression of sexual traits without activating the reproductive system; it shows how the organizing actions of sex hormones in early (embryonic) development affect mate preference in adulthood; and it correlates the production of sexually attractive male song with features of the brain and their stimulation with

testosterone.

S15 — Specialization in island land birds (5 papers) focuses on evolutionary specialization and flexibility in island land birds as strategies for survival, considered against backgrounds of diet-driven evolutionary radiation in Darwin’s finches and Hawaiian honeycreepers, the benefits of cooperative breeding in the Seychelles warbler, generalist foraging release in island Australasian silvereyes, and shifts in breeding times to synchronize with diverging food availability in different habitats in the blue tit, with implications for parapatric speciation on Corsica.

S16 — Chemical ecology and the study of bird reproduction (5 papers) considers the role of chemical compounds in proximate and ultimate aspects of reproduction, addressing such issues as differential composition of preen waxes between seasons, impacts of vitamin availability through the food chain, parasite suppression by volatile compounds in nest material, and the role of antioxidants such as carotenoids which strengthen immune response and express fitness through brighter coloring.

S17 — Evolutionary history of selected bird taxa from the Sino-Himalayan region (5 papers) produces, using grouse, the Sichuan jay, golden-spectacled warbler complex, snow and mountain steppe sparrows, and redstarts as examples, a series of studies illustrating the importance of the Sino-Himalayan horst as a refuge and center of evolutionary radiation for modern species-groups of Eurasian songbirds.

S18 — Sexual signalling and speciation (4 papers) connects sexual selection with morphological and genetic differentiation and speciation, drawn from comparative patterns of morphological and molecular differentiation, the interactive roles of male display, environment and female choice, the causes of pre- and post-mating reproductive isolation, and the consequences of learning sexual signals. The symposium summarizes the diverse forms of reproductive isolating mechanisms and their meaning for speciation.

S19 — The evolution of avian migration (5 papers) broadly covers not only the origin of migration in phyletic lineages but also mechanisms for adaptive change and supporting environmental conditions which underlie migration. It summarizes evidence for the development of long-distance migration by using tools of molecular-based historical biogeography and population genetics, by assessing ringing combined with stable isotope marking and satellite-tracking, by evaluating interactions between environmental variation and phenotypic plasticity, and by developing annual routine modeling.

S20 — Evolutionary genetics of the Phasianidae (4 papers) uses molecular technology, including a novel nuclear hemoglobin gene suitable for use at different taxonomic ranks, to present new advances in elucidating phylogenetic relationships among the Phasianidae at species, generic and supra-generic levels. Included is an overview of the phylogeny of the landfowl, order Galliformes.

S21 — Visual behavior in birds: linking brain and behavior (4 papers) explores at both embryonic and adult levels the development of different functions in right and left eyes, and the role of the nervous system in transferring different classes of images by different pathways to different parts of the brain for processing. Highlighted here are some remarkable advances in unravelling “lateralization” in the sight of birds, showing that the left eye is used for wide search and orientation on distant objects and the right for control of manipulation and close-up responses.

S22 — Torpor in birds: regulation of energy metabolism and body temperature (5 papers) addresses the rationalization of terms used for describing the metabolic effects of torpor and reviews the occurrence, daily timing and stages of torpor in the Aves, with emphasis on Trochilidae and the Caprimulgiformes. One paper focuses on the development of models to predict torpor.

S23 — The biological species concept: application in pure and applied ornithology (5 papers) reviews the development of species concepts in general and the biological species concept (BSC) in particular, teasing out the philosophical differences between concept, rank in classification and the species in nature. Examples are given of difficulties in application, and of alternatives to the “biological species” as the basal biodiversity unit for conservation. One compromise solution, that of classifying species by a combination of concepts in a single classification, nevertheless begs the question: is it scientific?

S24 — New directions in avian molt ecology (4 papers) evaluates new concepts and statistical methods in elucidating molt patterns and their adaptations to environmental circumstances and seasonal availability of food. It covers seasonal effects on the rate of wing molt in migrating shorebirds, adaptations of molt to seasonal cycles, including double molt, and seasonal molt in penguins in relation to breeding and food availability.

S25 — Population regulation in heterogeneous landscapes: a means for predicting the consequences of environmental change (2 papers) reviews diverse issues of population regulation, one paper dealing with regulation in cooperatively breeding birds, and the other with the mechanisms and prediction of regulation more generally, demonstrating the important role of “site-dependence” in birds, outlining procedures for its identification and explaining why it needs to be distinguished from “crowding” in conservation management.

S26 — How birds sing (4 papers) examines the functioning of the syrinx and vocal sacs in birds, the airflow systems that drive them, the physical mechanism of song production and the phonic structure of sound produced. Included are papers demonstrating the newly-found importance of lateral, not medial, tympaniform membranes in producing complex, bi-lateral sounds, and of the nerve systems directing them. Such advances have been made possible by microlesion technology and endoscopic examina-

tion of the vocalizing syrinx with laser light.

S27 — Morphological integration and modularity (5 papers) deals with the emerging appreciation that evolution in birds has developed complexes or “modules” of co-varying morphological traits in response to such adaptive pressures as feeding and flight. The interplay of module heritability and selection is examined, along with correlations of form and life-style, and their phylogenetic basis, towards improving understanding of avian evolution and biological systems.

S29 — New developments in the study of seabird foraging (4 papers) reviews progress and technological advances in research into seabird foraging, illustrated by case studies of the way procellariiform seabirds track food by smell, how penguins manage buoyancy and search underwater, and how cormorants cope with different temperature regimes by budgeting foraging time.

S30 — Interactions between coastal aquaculture, fisheries and birds (2 papers) approaches this emerging conservation issue from two different perspectives, one involving development of behavior-based models to predict effects on coastal birds by changing environmental conditions, the other relying on actual demographic records to report serious declines in bird populations and species in shrimp-farmed mangrove environments in India.

S31 — Bird population explosions in agro-ecosystems: common factors in case histories (5 papers) draws together common threads, based on the starling in Britain, the quelea in Africa, cranes in India and the eared dove in South America, for causes of population explosions in birds, all of them linked to changes in local environment, habitat and an expanding agriculture.

S33 — Competition and hybridization from introduced waterbirds: a rising political issue (5 papers) addresses the effects of introduced waterfowl on indigenous waterfowl, and their control, by assessing the extent of introductions, illustrating the actual and potential impacts of the North American ruddy duck and mallard in Europe and New Zealand respectively, and reviewing available legislative capability and its needs.

S34 — Optimality in bird migration — the role of stopover ecology (4 papers) reviews advances in understanding the ecological and physiological mechanisms of migration, focusing on the importance of stop-over sites for refuelling. The symposium covers modeling that integrates fuel loading and flight mechanics to predict optimal flight times, and addresses factors affecting departure decisions and refuelling drawn from capture-recapture data, both theoretically and empirically.

S35 — Bird minds (5 papers) introduces the rather controversial field of avian cognition, and covers spatial recognition by birds, the learning of abstract skills, combinatorial skills, language and, in the case of the New Caledonian crow, tool manufacture. Comparisons with primates are drawn repeatedly, demonstrating that birds have

higher cognitive capacity than is often thought.

S36 — Energetics, physiology and biochemistry of bird flight (2 papers) focuses on the use of wind tunnels to test predictions of the energetics of bird flight from theoretical modeling with empirical data that use heart rate as an indicator of metabolic rate and evaluate the effects of size on energy and water use during migratory flight.

S37 — Global seabird conservation (5 papers) has a central theme, namely, that approaches to seabird conservation must be global and international because seabirds are rarely tied to political boundaries. The theme is illustrated with case studies of fish-catch interactions between seabirds and fisheries, the conservation of particular rare and endangered species, management of mortality from long-line fishing, and assessments of sustainable harvesting of seabirds and global trends in survival.

S38 — Phenotypic plasticity and early developmental conditions in birds (5 papers) considers the adaptive functions of phenotypic plasticity, and how the quality of the egg (maternal effects), embryonic environment, and environmentally-induced responses in nestlings may all influence fitness in adulthood.

S39 — Ecological forestry and avian communities (5 papers) examines the effects of silviculturally managed forests and forest fragmentation on bird life in diverse global regions, using case studies from Taiwan, Japan, Central Canada, India and the longleaf pine ecosystem in eastern USA. All corroborate the importance of maintaining complexity in forest structure.

S40 — Periodic environmental changes: understanding the physiological basis of life history adaptations (1 paper) concerns the mechanisms underlying life history adaptations in breeding, migration and molt. The single paper addresses the constraining effects of environmental seasonality, breeding and migration on molt.

A further highlight of the Proceedings, as befits the host nation, is the focus on the new and remarkable discoveries of fossils of early, pre-Paleozoic birds in China over the last several decades. Not only do the discoveries throw light on the ancestors and early evolution of birds but they

also bring insights to the origin of feathers and development of flight, issues that are core subjects of three plenary addresses and one symposium paper (S06:2), and were implicated in one more plenary address and two further symposium papers.

It is to be regretted that the Proceedings of the 23rd International Ornithological Congress has appeared so long after the Congress itself. A product of unforeseen circumstances, delays began with impractical deadlines for submission of manuscripts, which were rarely kept and diverted me to much emailing to collate what I could. It was not until mid 2004 that sufficient material had arrived for putting the Proceedings together. Despite the facilities offered by computing and the internet, it is also clear that the publication of future Congress Proceedings can only be managed by professional editorial bodies with a number of full-time staff that can handle not only the actual editing, but also the coordination required to chase up late papers and the computing power to decode and reformat papers submitted in diverse programs with frustratingly perverse defaults.

Although delayed, the Proceedings nevertheless still fulfill their central goals, that of producing a formal record of the 23rd International Ornithological Congress and of recording the general state, progress and directions of ornithological knowledge and research at the time. For its final full publication in hard copy, I must thank, above all, the China Organizing Committee in general, and Professor Jia Zhi-Yun and Mr Liu Feng in particular. Professor Jia, editor, *Acta Zoologica Sinica*, and Mr Liu, Assistant Secretary-General for the Congress, handled the processing of papers in Beijing, and dealt with me promptly and patiently. Their innate professionalism was of immeasurable help in our collegiate interactions.

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