with those of the winter 1975/76 (Mendelssohn and Paz, 1977), it is obvious that notwithstanding the reduced area of alfalfa fields and the generally smaller number of birds of prey observed in the area, the amount of affected birds is still very high, emphasizing how dangerous secondary poisoning by Azodrin is for birds of prey.

In 1975/76 Black Kites were represented by large numbers on the Azodrin death roll. As already mentioned, few of them fed in the alfalfa fields in 1977/78 and therefore the number of affected individuals was relatively low. A considerable decrease is noted in the number of affected Kestrels, Barn Owls and Short-eared Owls. These three species are resident in the area, Short-eared Owls nesting almost exclusively in alfalfa fields. The reduction in the number of affected birds of these three species may indicate a progressive extermination of the local resident populations by the continued application of Azodrin. This extermination has possibly already been completed with the Short-eared Owl, for which the alfalfa fields were the nesting as well as the feeding biotope. In any case, no Short-eared Owls were found in 1977/78.

So far the Plant Protection Department has not taken action against the application of Azodrin in alfalfa fields, that is done in contradiction to its recommendations. Azodrin residues in alfalfa or in milk products have not been tested, notwithstanding that the news media in Israel dealt with the generally high level of pesticide residues in milk and milk products in Israel.

REFERENCES


Bustard Group

General Report

By N. J. Collar
(Chairman)

I regret to report that Dr. Rolf Lütken resigned the position of Secretary to the Bustard Group in April 1978. Since leaving the Great Bustard station at Oberweiden, Austria, in October 1976 Dr. Lütken has been under considerable pressure in a new editorial job in West Germany. I should like to express our gratitude to him for his enthusiastic and virtually single-handed work over the past five years; his published studies of bustards during this period form their own tribute to his energy. He remains a member of the Group.
I was asked to serve as Chairman in January 1978. The Group is currently undergoing a revision and extension of membership. Furthermore, in 1977–1978 the Fondation Internationale pour la Sauvegarde du Gibier established its own projects for the Houbara Bustard (co-ordinator, Dr. J. B. Platt) and the Great Bustard (co-ordinator, myself) which will extend our contacts considerably; the aim is to promote and help fund international research schemes on the two species. As will become apparent from the sections below, bustard studies are starting to gather momentum; but this is only just in time or may even be too late for several species, at least in parts of their range.

Great Bustard (*Otis tarda*)

Three symposia on this species have been held in Eastern Europe since the Group was established and a fourth is scheduled. The first took place at Komarno, Czechoslovakia, on 11–12 October 1973 (see ICBP President’s Letter 31, May 1974). The papers read at this meeting still remain unpublished. The second meeting was held at Gyula, Hungary on 28–30 September 1976. This symposium remained unannounced in the West but was well attended by representatives in Eastern Europe, and the contributions have been published in both Hungarian and German as A II. Nemzetközi Tüzokvédelmi Szimpozium Előadásai (Békéscaba 1977), edited by L. Boross and available through Dr I. Sterbertz, Madártani Intézet, 1121 Budapest, XII Költo u 21-23. The third symposium was arranged by the Fondation Internationale pour la Sauvegarde du Gibier as a one-day supplement to the twenty-fifth Triennial Assembly of the International Council for Game and Wildlife Conservation (CIC) held in Sofia, Bulgaria, on 28–31 May 1978. The papers presented are currently being edited for publication. The fourth meeting should take place in Poznán, Poland, in fall 1979, and subsequent meetings and their locations may then be decided. Summaries of and comments on the reports from the Gyula and Sofia symposia will be published in the Review section of *Ibis* in the near future.

The status and numbers of Great Bustard throughout its range have become considerably clearer in the last few years, largely as a result of work reported on in the symposia above. We are therefore in a position to give the first indication of the total world population of this species, although the figures arrived at must be treated with the greatest caution. In the following list, numbers followed by year only are taken from papers in the Gyula and Sofia symposia.

<table>
<thead>
<tr>
<th>Country</th>
<th>Numbers</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>USSR (both races)</td>
<td>8,650</td>
<td>(Isakov 1974)</td>
</tr>
<tr>
<td>Iran</td>
<td>50–150</td>
<td>(1978)</td>
</tr>
<tr>
<td>Turkey</td>
<td>200–1,000</td>
<td>(MAS Beaman, RF Porter in litt. 1978)</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>probably extinct</td>
<td>(1976)</td>
</tr>
<tr>
<td>Rumania</td>
<td>296</td>
<td>(1976)</td>
</tr>
<tr>
<td>Poland</td>
<td>80</td>
<td>(Dr A. Bereszyński in litt. 1978)</td>
</tr>
<tr>
<td>East Germany</td>
<td>800</td>
<td>(1976)</td>
</tr>
<tr>
<td>Hungary</td>
<td>3,237</td>
<td>(Dr. I. Sterbertz, verbally 1977)</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>400–500</td>
<td>(1976)</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>20</td>
<td>(1976)</td>
</tr>
</tbody>
</table>
In addition to this, I am pleased to report that China still holds good numbers of the race *dybowskii*, according to Prof. Tso-Hsin Cheng (verbally 1978); and the possibility that the species breeds in undiscovered pockets of North Korea, and in northern Syria and Iraq cannot as yet be discounted. It should be stressed, however, that although in some circumstances a population of 25,000 or more birds might be considered a healthy situation, this is clearly not one of them; the birds are distributed across 7,000 miles in discontinuous patches, and nearly all of these patches are threatened by human pressures.

Easily the most striking feature of this list is the extraordinary number of birds reported from Spain, which as it stands represents some 41.5–43.7% of the ‘World Total’ given. Nevertheless, a massive decline in Spanish birds is (generally) considered to have occurred, and it is obviously essential that censuses continued annually to monitor the progress of the remaining population. In consequence of representations by the Spanish delegation at the Sofia symposium, it was agreed to put forward a recommendation regarding the need for special measures for the preservation of the Great Bustard as follows:

Taking into account the serious decrease in Great Bustard populations in the Palearctic region and the maintenance, in Spain, of a relatively stable population, [this symposium] urges the Spanish Government to consider special measures which might ensure and favour development of Great Bustard populations in the areas of their optimal habitat, i.e. where the greatest concentration of this species is found.

The ICBP Bustard Group gives its full support to this recommendation; and a bustard symposium to be held in Spain before long would, I think, prove highly valuable. In recent years it has been established that Portugal also holds a reasonable population of Great Bustards: the Great Bustard Trust, which has financed four consecutive journeys to this country, is continuing to sponsor research on populations there and I hope that counts will become more and more exact with time and experience. Although the situation in Morocco is critical, the record cited above is the first in recent times and serves at least to indicate that the species maintains a toehold in Africa: the possibility of active conservation is currently being investigated.

The most impressive achievement in conservation comes from Hungary, which is the only country where the Great Bustard population is known to be increasing. Changing agricultural practices, an exceptionally rigorous fine for killing a bird (equivalent to £1,500 sterling), and a positive strategy to prevent birds nesting in unsuitable habitat, have resulted in a steady improvement in numbers (in 1960 only some 2,000 were present). In addition, a captive breeding project is planned at Dévavánlya in the south-east, using birds reared artificially from discovered or abandoned clutches. In East Germany, the
population appears to have been maintained by an enterprising programme of releasing artificially reared young; a good success rate has apparently been achieved but more precise details are needed. Despite intensive efforts to protect and conserve Great Bustards in Poland and Austria, the numbers there dwindle year by year and the outlook is gloomy; moreover Department 3 of the Institute of Comparative Ethology (Oberweiden, Austria) has closed and the research being undertaken there (see Lütkens and Dangel 1975) discontinued. The reports from Rumania and Bulgaria are also disappointing; Rumania in particular was long believed to be a stronghold of the species, and intensive efforts will now be necessary to prevent the remaining population from disappearing altogether. The population in Turkey will be the subject of an expedition to be mounted in 1980 or 1981.

Captive breeding projects exist in England (no success yet), Poland, East Berlin Zoo, Hungary and Spain (birds too young).

**Little Bustard (Tetrao tetrix)**

The decline and disappearance of this beautiful but little studied species has been barely lamented and poorly recorded. It appears to have become extinct throughout eastern Europe, while only remnant populations persist in Italy, Sardinia and France; indeed, French observers consider it unlikely to survive beyond the turn of the century. Formerly abundant in North Africa, it is no longer recorded breeding in Algeria and Tunisia and has vastly decreased in Morocco (e.g. Pineau and Giraud-Audine 1977). It may no longer breed in Turkey, and in the USSR there have been repeated indications of a considerable overall decrease in numbers. Only in parts of Spain and Portugal are numbers still high; but even here a decline may well be in progress, unobserved because as yet unobtrusive. We may well soon have to seek conservation measures in these two countries to safeguard the species, since only there and in the USSR does there appear to be any real chance for its survival. The situation must be regarded as in many ways worse than that of the Great Bustard.

A degree of success with captive breeding has been reported (von Frisch 1976). M. Michel Metais is beginning a study of the species in France.

**Houbara Bustard (Chlamydotis undulata)**

The fundamental problem with the Houbara is a total absence of reliable information concerning its numbers, distribution and movements. The severity of its position cannot be assessed. Since the excessive hunting of the bird by dignitaries and falconers—reputedly involving an international network of betting on bags—is considered the major cause of whatever decline has occurred, the solution to the problem lies in agreement at the highest level. Meanwhile we must record with concern the continuation and extension of this hunting activity; it would be valuable if a full documentation of Arab hawking parties since the mid-1960s could be undertaken, since this could serve as a general indication of pre-existing populations and their progressive decline.
Under the co-sponsorship of the Fondation Internationale pour la Sauvegarde du Gibier and the ICBP Bustard Group, a one-day Houbara symposium, chaired by Dr. J. B. Platt of the Sulman Falconry Centre, Bahrain, is to be held on 24 May 1979 in Athens. The ICBP Fuerteventura Houbara Expedition, March–April 1979, has been organized to ascertain the status, distribution, ecology and behaviour of the exceptionally rare endemic eastern Canaries subspecies.

Israel has had a measure of success with captive breeding (see the paper immediately following), but a major project that was to have begun near Yazd, Iran, must because of the political changes now hang in the balance; another project for captive breeding in Saudi Arabia, being negotiated through the US Fish and Wildlife Service, awaits final approval and may yet be cancelled. Several Arab dignitaries have shown interest in this form of conservation, but it remains to be demonstrated that confined Houbaras can be propagated in numbers sufficient to justify the disturbance, stress and losses of birds incurred by recourse to the method.

**Great Indian Bustard (Ardeotis nigriceps)**

This is the rarest and most clearly endangered species of all. In 1969 Dr. K. S. Dharmakumarsinhji reported an estimated total Indian population of 1,260 birds. In 1978, his estimation was of 745. A mere handful (c. 20) are reputed to dwell just across the border in Pakistan. The need for action is patent. Since August 1978 Dr. A. J. Gaston has been gathering first-hand information on the situation in India and extending our sphere of contact, and we await his report in due course. The Group should then confer and propose active conservation measures.

Several Great Indian Bustards are known to be held in captivity at present, and the establishment of a single captive breeding project modelled on that for the Australian Bustard (below) now requires serious consideration.

**Australian Bustard (Ardeotis australis)**

While it remains a high priority that active research should be carried out to monitor the (apparently still deteriorating) situation of the Australian Bustard, excellent news comes from Mr. Don White (*in litt.* 1978) at the Serendip Wildlife Research Station, Lara, Victoria. He reports that from a penned stock of fourteen adult bustards three young were successfully reared in 1976 and four in 1977. This appears to be the best success ever achieved with the captive breeding of any large species of bustard, and Mr. White and his staff are to be congratulated on their achievement. Publication of the details is anticipated at a later date.

With this actual and potential growth in bustard studies, the group faces an important extension and redefinition of role. In the past it has tended inevitably to function as the ‘Great Bustard Group’; a wider perspective is now demanded, and it must be for the Group itself to set its own targets and priorities in a more openly international context.
Membership might better be restricted to those who are actively engaged in the study or conservation of bustards in a full- or part-time capacity. However, since one of our principal functions is the gathering of information, we need to secure the assistance of many more people than at present, and where these are likely to provide a continuing source of data they should have equal status as corresponding members, their names and addresses being listed and circulated in the same way as the members’ are now.

With the co-operation of members and corresponding members of the reconstituted group, it is hoped to produce a register of the legal status of all species of bustard in the countries in which they occur. Anyone who can provide information on this is urged to write direct to the Group Chairman, Edward Grey Institute of Field Ornithology, Department of Zoology, South Parks Road, Oxford OX1 3PS, England. Moreover, anyone who believes he or she may be in a position to assist the group in any way (e.g. by supplying material on the African species, records of Houbara bags, counts of Little Bustards, old breeding records, etc.) is similarly urged to write direct to the Chairman. Lack of data is otherwise likely to remain for years one of our foremost obstructions to progress.

REFERENCES


Captive Breeding of the Houbara (Chlamydotis undulata macqueenii) and a Description of its Display

By H. Mendelssohn, U. Marder and M. Stavy
Department of Zoology, Tel-Aviv University

Introduction

Populations of the Houbara Bustard have been declining in recent years, mainly owing to overhunting (Mirza 1971; Lütken 1975; Ferguson 1977; Kroll 1977). The main wintering grounds of the Asian populations are in Pakistan (Dement’ev and Gladkov 1951), where annually 5,000–8,000 Houbaras are killed by visiting falconers, even in national parks, notwithstanding the Pakistan game laws that restrict hunting of this species (Kroll 1977). The Houbara was already extremely rare in eastern Jordan in 1965, also