The single most salient fact that must strike any researcher gathering material on the houbara is our total ignorance of the bird, both at the level of its general biology and ecology and in such fundamentals as its distribution, movements and numbers. It is, indeed, the widespread concern about numbers that is largely responsible for the convening of this meeting today. In the review which follows, I have assembled what evidence I can find, from published sources and personal contacts, on the status of the houbara in every country in which it occurs; but nowhere can my conclusions be considered definitive, and I should stress that this compilation will have served a principal purpose if it merely demonstrates how inadequate and qualitative the material is on which it draws, and thus acts as a stimulus to and source for the future research on populations that is so badly needed.

Saudi Arabia

The status of the houbara as a breeding bird in Arabia has never been satisfactory elucidated. Early reports state that the bird is 'common in the hinterland of Arabia and breeds freely there' (Ticehurst et al. 1922), and that 'in rainy years they may be plentiful; like true nomads, they follow the vegetation' (Ticehurst and Cheesman 1925); these latter mention a nest of three eggs in February and one of four in April, both near Riyadh. Bates (1937) concludes that the houbara breeds throughout Arabia, but while Dickson (1949) confirms the houbara’s dependence on rains, he emphasizes that the bird is chiefly a winter visitor from the north.

On first reaching Arabia the houbara makes for the small new green shoots of grass that come up with the early rains or wassm season (October). As the rainy season develops and grass comes up everywhere, the birds scatter and proceed deeper and deeper into the interior, until they are found as far inland in the north as the Syrian desert, and in the south round about Riyadh and the oasis of Jabrin. Except in small numbers the birds do not penetrate much west of this line.

Round about Zubair, Kuwait and further south as far as Qatar, the birds are very plentiful throughout the winter, and many thousands of birds are each season killed for food by the local Arabs. In Kuwait the sheikhs generally bags about two thousand birds every cold weather, and the combined members of the Al Sa’ud get about the same number in Najd proper, as also do the Shaikhs of Bahrain, both on their own islands as well as on the mainland where they regularly hunt.

... A very few remain behind in Arabia each year and breed locally, but these are rare. I have myself seen a couple of houbara eggs (15th March, 1935) which were found 40 miles south of Kuwait.
Dickson goes on to provide a classic account of the tradition of falconry in Arab culture, and of the centrality of the houbara to that tradition. Thesiger (1959) provides another; but this latter, coming ten years later, ends with an ominous remark:

We rode singing into camp long after dark, tired and bitterly cold, but well content with our opening day [on which they killed 11 houbara]. As we sat round the fires and went over the kills again and later as I lay awake under the blazing stars and listened to the restless moaning of the camel herds, I was glad that we were hawking in the traditional way and not from cars as they do nowadays in the Najd.

Meinertzhagen (1954) reported the houbara to breed regularly in the desert regions of the Arabian peninsula from Kuwait to near Muscat and from Aden into central Saudi Arabia, but according to the summary prepared by Ferguson (1977), the houbara is now probably and at least virtually extinct as a breeding species in Saudi Arabia, although some may still occur on the Summan plateau in the al-Habl area. A royal order in 1969 prohibited the hunting of bustard and banned the use of shotguns, but there is no governmental agency to enforce such regulations and the Bedouin will always attempt to kill any houbara they encounter. After protection was imposed in Iran at the start of the 1970s, there was a noticeable increase in immigrant numbers in northern Saudi Arabia, but Ferguson's sources indicate that, in general, wintering birds are still so few that no-one troubles to mount hunts for them, electing instead to travel abroad to do so.

(An important modified view of the situation in Saudi Arabia was presented at the Symposium by Dr. J. E. Burchard, King Khaled's falconer. Although he was reluctant to mention any figure, he reported that the King still successfully takes large quantities of houbara in the winter hunting session, and that he has reliable information suggesting that birds still breed in some areas.)

Jordan

One of the first indications of Western conservationists' concern for the disappearance of wildlife in the Middle East was the account of the Jordanian desert by Mountfort (1965). His team's search for the houbara was almost entirely fruitless. 'From 1917 to 1918, when Lawrence of Arabia was scourging the Turks and blowing up bridges along the Hejaz railway between Aqaba and Damascus, he and his Bedouin raiders lived off the desert and seldom went hungry. Gazelles and houbara bustards could be shot almost everywhere. . . .' Less than half a century later he could only sadly report: 'The feather from Azraq and the egg-shell from El Jafr represented the sum total of evidence obtained in a month's search for the once plentiful houbara in Jordan.' Mountfort may, of course, have been considerably misled by Bedouin through their natural disinclination to share their knowledge with Westerners not yet tried and trusted; nevertheless, he and his co-workers formed a highly experienced and competent group of observers, and if they saw no houbaras — with or without the help or hindrance of the Bedouin — we must accept this as a fair indication of the relative scarcity of the species. Subsequently Nelson
(1973) offered a more hopeful but still heavily qualified view of the houbara's status: 'The Azraq basin and much of the Park seem to fit its needs exactly, and it was previously abundant, although it is now difficult to find any. But they still breed there and given adequate protection would gradually rebuild their numbers . . . ' More recently still (1976) there have been reports of an estimated minimum of 15 pairs in the Park; and they appear to be spread 'fairly plentifully' in parts of the south of the country (C. D. W. Savage, _in litt._). Shooting of gazelles and houbaras from cars was prohibited by King Hussein in the mid-1960s (Mountfort 1965); the houbara is now completely protected in Jordan (Ferguson 1977).

**Israel**

For a full modern assessment of the species's status in Israel, see Mendelssohn (this Symposium). It is of interest, however, to note that more than a century ago it was 'very common in the Jordan valley', being seen 'day after day in small flocks', and where its preferred food 'appeared to be the desert-snails so abundant on the scrubby vegetation of the plain' (Tristram 1868).

**Syria**

Kumerloeve (1968) describes it as follows (my translation):

Still quite numerous as a nesting species, and distributed throughout the Syrian desert and semi-desert; but generally in decline owing to massive persecution. According to Aharoni it nests from the last 10 days of March up to the end of May; usually 3 eggs, but up to 5; a chick has been found as early as 11 April. Brown found the houbara 'not uncommon' to the east of Deir-es-Zoor. . . . Hunting bustard with birds of prey must still be practised locally.

Single birds were frequently seen throughout the Aleppo/Ersieye/Raqqa area of the north Syrian Desert in spring 1943, but despite frequent searches during a 14 month stay based in Damascus, 1976–77, only a single bird was seen (Macfarlane 1978).

**United Arab Emirates**

Small numbers pass through in winter, heading for the Arabian hinterland. If breeding occurs at all, it would seem to be in very feeble numbers. Other than from hunting pressures, the decline thought to have occurred may be in part attributable to locust-control programmes (C. D. W. Savage, _in litt._); however, we would need extremely precise information on the nature and extent of these programmes, and on the birds' dependence on locusts or locust habitats, to assess the actual and potential consequences for houbaras.
Oman

Stanford (1973) describes the houbara as a winter visitor ('widespread in all desert areas'), with most records from August to March, but apparently also resident, breeding south of Ibrî. Second-hand information from C. D. W. Savage (1976, in litt.) is that 'they are not hunted except by visitors from the Emirates who find that they are still widespread in fair numbers'. M. D. Gallagher is currently preparing a full report on the status of bustards in Oman.

Iraq

Nearly 60 years ago, Ticehurst et al. (1922) found the houbara 'pretty common throughout Mesopotamia and is resident, or at the most a local migrant'; they provide a valuable list of localities. In November 1922, Meinertzhagen (1924) found it 'common on the desert west of Ramadi', saw 'several parties... on the desert south-east of Baghdad' and some individuals near Hadr; he mentions the belief that they leave the Iraq plains after the first heavy rains in November. Moore and Boswell (1956) also record the species from Hadr and that it replaces the great bustard Otis tarda in this area south and west of Mosul, 'whence it moves further to the south when the rains start'. However, in the centre and south of the country, the same authors only report two occasions, both in October, when houbaras were found to be numerous, adding that data are too scant 'to establish their movements, but they have been surprisingly absent from known localities some years....' Marchant (1961) had reports of fairly plentiful occurrences near Zubair, near Amara, and at a locality 40 km south-east of Baghdad, but he continues:

I would suggest that this species is no longer common and rapidly becoming more scarce. It seems certain that it has decreased since Ticehurst's time. Senseless shooting of the birds from cars is probably a cause and if what I have been told is true, that piles of Houbara feathers have been found in the deserts south of Rutbah after hunting trips across the border by Kuwaitis and Saudis, there seems little likelihood that such a vulnerable species will survive in those areas.

The same writer (1962) failed to find evidence of the houbara breeding in the Jazia area, 20-30 km east of Baghdad, concluding 'they must be very scarce', and he and Macnab (1962) were disappointed with the lack of records from Habbaniyah and Shaiba, which they took as 'further confirmation for its present day scarcity'. Allouse (1961) reported houbaras as very strongly hunted.

The current situation in Iraq is unclear. C. D. W. Savage (1976 in litt.) mentions a report that the houbara is still 'quite plentiful' in the south.

Iran

Before full protection for the houbara was enforced, Erard and Etchécopar (1970) reported it as 'formerly widespread in Iran. It seems that here, as in North Africa, it has seriously declined' (my translation).
Following protection, the report filed by Scott (1975) contains a brief, clear assessment of the bird's status: 'Iran remains one of the last strongholds of the species, yet even here populations are steadily declining. Only in some of the Department of the Environment's reserves, where the habitat of the bustards is slowly regenerating after centuries of man's abuse, is the houbara holding its own and perhaps even increasing'. The Department of the Environment has been retained following the 1978–79 revolution, but game has been seriously affected through lack of law enforcement (E. Kahrom, pers. comm.); the future of the houbara and its reserves is clearly unpredictable.

Afghanistan

Records are extremely scarce. Paludan (1959) saw six birds in eighteen months' fieldwork. S. C. Madge (in litt.), who is currently compiling a checklist of the birds of the country, knows of a single more recent record. Information given to C. D. W. Savage (in litt.) is that 'they are not very numerous in winter'.

Pakistan

Houbaras drain into Western India and Pakistan from the USSR to winter, but they may also breed in both countries in very small numbers. Until Arab dignitaries began to hunt houbaras in the deserts of eastern Pakistan, it appears never to have been realized just how great were the quantities of birds wintering there. The comprehensive summary of the houbara and its use as a game bird given, for example, by Baker (1912) does nothing to prepare us for the kind of numbers we find have been taken by Arab falconers in recent years. Baker was dealing primarily with Indian records, but his survey embraced Pakistan; it is at any rate interesting to find this written, nearly seventy years ago:

This bustard, like the others of the order, is more or less gregarious, but never seems to collect in very large flocks. Hume states that he has put up as many as twenty birds in a flock, but most of my correspondents speak of seeing small flocks of three to five or six and I have received no information of flocks as large as that seen by Hume...

Hume was very successful in shooting this bustard and he records, in *Game Birds*, that in 1867 he killed no less than 83 birds, 47 cocks and 36 hens, in one week in November.

Mirza (1971) refers to hunting parties coming to Pakistan from the Persian Gulf for some 4–5 years, so we may take it that intensive Arab hunting began there around 1966. As early as 1967 the Chief Conservator of Forests responsible for the desert area of Cholistan convened a seminar on wildlife at which delegates reported declines in houbara numbers and called for the imposition of quotas (T. J. Roberts, in litt.). Soon afterwards Mountfort (1969), who as we have seen had already been alerted in Jordan to the plight of the houbara, gave the problem further publicity:
We found the Hotel Intercontinental (in Lahore) full to bursting with a large party of sheikhs from Abu Dhabi, each of whom had brought with him a Saker Falcon, or a Shahin, or a Peregrine. . . . We had heard that at least sixty falcons were to be flown after houbara bustards in Cholistan and were horrified that this additional persecution was to be imposed on these rare birds. . . . Having exterminated all the game in their own country, the sheikhs should not be permitted to hunt in other lands.

The following year, however, two more parties of sheikhs with falcons killed between them 600 houbaras, which that winter had arrived in unusually large flocks. This slaughter caused such a commotion among the growing number of officials who were interested in conservation that representations were made to prevent the sheikhs from receiving any further invitations to practise their sport at the expense of Pakistan’s wildlife.

A further expression of alarm came from Roberts and Savage (1971):

All sportsmen who know this bird will agree that its numbers have declined dramatically in recent years in Pakistan and, if some restraint is not exercised in the hunting of this bird in its winter quarters, then at the present rate of decline it will very soon disappear altogether. . . . if this grand bird is to be preserved for the pleasure of future generations as well as to provide sport for future hunters, then bags such as that obtained by individual shooters (43 by a certain Zaminder in Thal in 1968) as well as by organized hunting parties with falcons (over 900 by one party in 1969, and around 2,000 in 1971) must be curtailed.

Still nothing happened; in 1973 WWF Pakistan abandoned a proposed houbara study project, and since then Arab hunting parties have relentlessly persecuted the wintering populations, achieving annual bags of several thousands and up to 8,000 in one report (Kroll 1977). At the ICBP World Conference, Canberra, in August 1974, a unanimous resolution was passed urging the Pakistan and Russian governments ‘to co-operate to ensure the Houbara Bustard is not exterminated’. In the last 4–5 years it has been impossible to obtain reliable figures of kills, although reports indicate that numbers have been decreasing. This decrease, coupled with the escalating costs of mounting expeditions, has made hunting rather less worth the time and effort; even so, annual visits persist (T. J. Roberts, in litt.).

(In the discussion that followed the reading of this paper, the Pakistan Ambassador in Athens announced that a captive breeding project for houbaras would be established in eastern Pakistan.)

India

There is an extensive body of anecdotal literature on the hunting of wintering houbara in India, emanating from colonial British writers in the century up to independence. Its chief interest now must lie in the listing of areas where the birds were once to be found. Little has been written since the departure of the British
other than the fine general accounts in, for example, Dharmakumarsinhji (1955) and Ali and Ripley (1969), and it would appear that until the early 1970s the Indian houbaras largely escaped the depredations of hunters. Dr. T. Razdan has, however, submitted the following figures and comments concerning foreign falconing parties in the last 5 years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Figures</th>
</tr>
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<tbody>
<tr>
<td>1974</td>
<td>Two Arab dignitaries visited Rajasthan and killed 500 and 1,500 birds respectively.</td>
</tr>
<tr>
<td>1975</td>
<td>Two Arab dignitaries visited Rajasthan and killed 400 birds.</td>
</tr>
<tr>
<td>1976</td>
<td>One Arab prince killed an official total of 163 birds; the actual total was considered by Indian observers to be far higher. Several Arab dignitaries ‘hunted birds in huge numbers in Rajasthan desert indiscriminately’; no official figure of the kills was made available.</td>
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<td>One Arab dignitary obtained permission to kill 270 birds; Indian observers reported this number was considerably exceeded.</td>
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<tr>
<td></td>
<td>One Arab prince obtained permission to kill 140 birds in a six-day period; Indian observers reported that this number was considerably exceeded and that hunting took place over an eighteen-day period.</td>
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<tr>
<td>1977</td>
<td>One Arab dignitary obtained permission to kill 200 birds.</td>
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<tr>
<td>1978</td>
<td>One Arab dignitary killed 60 birds in 22 days. Another killed 75 birds in 7 days.</td>
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<tr>
<td>1979</td>
<td>Some houbara hunting is reported to have continued.</td>
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These figures show a pattern of steep decline in the size of bags since 1974. This may be the result of restrictions imposed by Indian officials; alternatively it may merely be a reflection of the declining numbers of birds to be encountered.

**U.S.S.R.**

Rozanov (1977) reports that the total area of deserts in the U.S.S.R. is some 300 million hectares, mainly in the Republics of Kazakhstan, Uzbekistan and Turkmenistan. It is across these vast areas that the houbaras breed before each year draining down into Pakistan and western India for the winter. The numbers of birds killed in these winter quarters indicate something of the (former) size of the Russian population, and suggest that Dementiev & Gladkov (1951) were probably over-cautious in describing nesting density in the Kyzyl-Kum as ‘occasionally 1–2 km apart, but much more frequently 5–10 km’; as Grote (1936) wrote (my translation), ‘in the areas where houbaras occur they are less often seen than their numbers would in fact imply. This is because they very well know how to conceal themselves in the vegetation so that their camouflage is put to best use’.

It is, however, clear that a general depletion of houbara stocks in Russia had set
in long before Arab hunting in Pakistan became a recognized threat. Dolgushin (1962) wrote: ‘the number of bustards at present is decreasing everywhere, and in Kazakhstan some species have in fact become a rarity. Not only has excessive persecution by man had an unfavourable effect on their numbers, but also the intensive ploughing-up of the steppe’. Specifically on the houbara he stated:

In several places, particularly near large industrial centres, the number of houbaras has noticeably decreased owing to uncontrolled shooting of birds from motor vehicles. . . . The periodical fluctuation of houbara numbers has not been studied, but undoubtedly their occurrence is the result of loss and depletion through starvation in their winter quarters in severe winters. Thus in the cold winter of 1919 near Ashkhabad a mass-mortality among the wintering houbaras was recorded; exhausted birds even flew into suburban gardens. . . . At present, hunting the houbara in Kazakhstan is everywhere prohibited. As one of our rare and indigenous birds it deserves every kind of protection. The collection of new data concerning the distribution, numbers and behaviour of this little-known bird is needed. (Translation: D. F. Vincent.)

Since this was written nearly twenty years ago, the situation has critically deteriorated. Extensive development of (and within) desert areas has led to over-grazing and degradation of habitat by domestic animals, while road construction, industrial growth, settlements, mining, drilling, canal-building, irrigation schemes, and the consumption of surface and ground water for industrial, agricultural and domestic needs (Rozanov 1977) must all amount to exert an intolerable pressure on the houbara in its breeding grounds. The Soviet Red Data Book (1978) thus lists the species as ‘very rare, with sharp decline in numbers. . . . Formerly nested . . . from Transcaucasia to Tura. Now found only in most remote areas, little visited by man, of northern Caspian region, also Kazakhstan, Uzbekistan, Turkmenia, Tura’. Under the heading ‘Numbers in Wild’ we find:

Not known exactly, but certainly extremely low and with steady downward trend. In the north of Aral Sea region, only 2–3 birds along 10 km of car journey. In the eastern part of the Karakum Desert/Aral Sea region, density not more than 10 pairs in 3–5 million hectares. . . . In the Kyzyl Kum/Aral Sea region, according to data supplied, not more than 20–25 pairs breed. . . . (Translation: M. G. Wilson.)

E. E. Syroietchovsky, who in the discussion following the FISG Great Bustard Symposium in Sofia, May 1978, estimated the total Russian population at only a few thousand birds, subsequently communicated to B. des Cleres that a recent six-week spring expedition to the Kyzyl-Kum encountered not a single houbara and was told that the species continues to decrease there: on one choice area, where suitable habitat covers some 10,000 km² – i.e. about six times the size of Fuerteventura (see Goriup & Collar, this Symposium) – only 3–4 pairs were thought to be nesting.
Egypt

Over a century ago, Shelley (1872) found houbaras commonly for sale in Alexandria market, but had no certain idea of their origin. The avifauna of Egypt has been astonishingly neglected, especially in recent years. Information on the houbara is very feeble. Since Egypt is the country where *Chlamydotis undulata macqueenii* separates from *C. u. undulata*, Meinertzhagen (1930) treats the two forms as follows:

*C. u. macqueenii*: There are two specimens in the Giza Zoological Museum obtained on the deserts east of Cairo in June and December. Has been frequently observed on the plains of northern Sinai, where it is believed to be a rare resident. Local Arabs are quite certain that they breed. . . . But the majority of birds are almost certainly winter visitors.

*C. u. undulata*: Sahara west of the Nile valley, where it is believed to be resident. In the Giza Zoological Museum are four specimens from El Dab’a and the Wadi Natrun taken in February, April and November. Many seen between Siwa and Salum in February 1920, and not uncommon round the Wadi Natrun at all seasons. Absent from Kharga and Dakhla in winter, but they appear in spring, and apparently breed on the desert edge, rarely in waste crop-land.

Moreau (1927) refers to ‘the known breeding-area in the coastal scrub-belt (Mariut)’ but Bulman (1942) found the birds only in the hinterland of Matruh ‘over a strip of the country between 10 and 25 miles from the coast and 150 and 250 metres above sea level’.

A recent Arab falconing party is reported to have killed several hundred houbaras in Egypt (R. Upton, pers. comm.).

Libya

Hartert (1923) found the houbara common on the plain near Sheleidima (Cyrenaica) in spring. Bulman (1942) saw flocks of 50 and once over 100 birds and considered them far commoner than in Egypt: ‘If undisturbed they frequent the same locality for several weeks at a time. They seem to prefer feeding on areas that have been cultivated and are most numerous on the edge of the small agricultural communities’. Guichard (1955) recorded winter aggregations of up to 20 birds. Bundy (1976) could not confirm Bulman’s flock-sizes with any recent records, but stated that the houbara ‘probably breeds throughout northern Libya’, adding that ‘it is much persecuted by gunners, who in the mid 1960s were shooting birds from motor vehicles; almost certainly by this time it must be less common than formerly’.

Tunisia

Whitaker (1905) described it as ‘not uncommon in Central and Southern
Tunisia', and had 'frequently observed the species on the plains between Feriana and Gafsa, and on those lying to the west and south of the latter'. Lavauden (1924), Bannerman (1927) and Bédé (1928) describe its distribution, but all report a decline in numbers, the bird tending 'to disappear rather rapidly before civilization'. Blanchet (1955), however, found it nesting still quite commonly in the south and far south before World War 2.

(For a new assessment of the houbara in Tunisia, see the Tunisian Delegation report delivered by Bel Hadj Kacem, this Symposium.)

Algeria

The third largest country in Africa, Algeria is still inadequately known to the ornithologist (as recently as 1976 a species of bird new to science was discovered there). Over a century ago, Gurney (1876) pronounced the houbara to be 'still common'. Koenig (1895) and Rothschild and Hartert (1912) generally agreed, the latter authors providing some indication of its area of distribution: 'found in the plain of El Outaya and south of Biskra, is comparatively common on the stony plateau between Laghouat and Ghardaia, and occurs on the great sea of halfa grass on the "Hauts plateaux".' However, Heim de Balsac (1924) reported a decline in both Algeria and Tunisia (my translation): 'This magnificent bird, formerly abundant, retreats more and more before civilization and the opening-up of plains for agriculture. . . . Nevertheless, it is still found in many places. But one must go to the least frequented parts of the Hauts-plateaux or into the open desert to find it in good numbers'. Two years later he could report that the species appeared to be unaffected by intensive hunting by tourists in the 'Daia' near Tilremt, and that traffic along the Ghardaia road caused birds little concern (Heim de Balsac 1926). I can find no authoritative recent account of the status of the species.

(In the discussion following the reading of this paper, A. R. Dupuy reported that there had been a serious decline in numbers of houbaras, at least partly from the direct and indirect effects of the opening-up of the Algerian desert in the quest for oil.)

Morocco

The houbara has been more carefully investigated in Morocco than anywhere else in North Africa, and it is worth citing some of the more significant modern observations. Blondel (1962) commented on its site-fidelity (my translation): 'one always rediscovers the same individuals in the same places. The birds live in isolation, or in little groups of up to 7 individuals, often victims of rifles and the machine-guns of the military. . . .' Smith (1965) remarked how 'one's attention is forcibly directed to the very local distribution of some species which breed south of the Atlas and which tend to occur in loose scattered concentrations, leaving unoccupied vast areas differing in no apparent way from those on which they are common. Species to which this particularly applies are the houbara. . . .' He goes on to generalize on the status of the species in Morocco: 'widely but sparsely
distributed in semi-desert with good scrub cover, often on the fringe of cultivations and sometimes in light bush. . . . No large flocks were seen, five in November was the largest.' Brosset (1961) contributed one of the fullest accounts of houbara ecology for anywhere in its range.

The 200 m isohyet delineates the limit of distribution of this beautiful species whose ecology is, in eastern Morocco, complementary to that of Otis tetraax. . . . It is still quite abundant in all the sectors where poachers in automobiles allow it some respite. . . . Artemisia steppe is the favoured biotope of the houbara. It benefits from the long views necessary for its security, which in turn conditions the distribution of the species more than does food. . . . In fact, it is eclectic in its choice of food, which according to stomach analyses I have performed consists of insects, arachnids, reptiles, berries, and a great deal of young green shoots. . . . In Morocco the houbara is a protected species; but effective control of hunters is difficult. Numbers of the species remained stable in the Berguent region from 1953 to 1959, particularly on the left side of the Berguent-Figuig line where hunting was almost continually banned. The survival of this species is linked to its protection from poachers in cars. . . . The houbaras generally live in groups of 4–10 individuals. These groups are composed of one or two fully adult males, of females and sometimes of young birds. They always keep to the same areas, where it is absolutely certain to rediscover them from one year to the next and whatever the season. . . . Isolated individuals are not rare, but they are not confined to areas in the way the groups are (my translation).

In subsequent investigations, Brosset and his co-worker Petter (1967) sadly reported that ‘the disappearance of bands of 6–10 (sic) individuals, met with daily in these regions between 1953 and 1959, is probably attributable to the excessive incursions of poaching hunters’ (my translation).

Arab hunting parties from the Gulf states have been active in winter in Morocco in recent years, and kills appear to have been high (P. Glasier, R. Upton, pers. comms.).

The Western Sahara

A second important account of houbara ecology, complementing that by Brosset (1961), is given in Valverde (1957), and this is accompanied with a map indicating known sites of occurrence. Distribution from the Sous to the Senegal River is further documented in Heim de Balsac and Heim de Balsac (1954).

Canary Islands

See Goriup & Collar (this Symposium).
Summary and conclusions

Including the Canary Islands and Israel, but excluding countries covered under 'Western Sahara' (Mauretania, former Spanish Sahara), this account reports declines in houbara populations in 15 (83.3%) out of 18 countries covered. Of the other three, two (Afghanistan, Egypt) are so little known that no statement can be made, and the third (Oman) has in any case never been considered of importance as a breeding area. Against this, information presented in discussion indicates that, despite earlier reports, Tunisia retains a very healthy population of houbaras.

Reasons for decline include excessive hunting (Israel, Iraq, United Arab Emirates, Pakistan, India, USSR, Libya, Morocco), overgrazing of habitat (Israel, Iran, USSR, Canary Islands), agricultural development (United Arab Emirates, USSR), industrial development (USSR, Algeria), 'civilization' (Tunisia), taking of eggs for food (Canary Islands).

There are no easy solutions, although the exercise of restraint by hunting parties is surely the most obvious. Other than that, reserves in suitable areas, carefully managed and properly policed, are important and probably essential requisites for the ultimate survival of the species. Furthermore, a full programme of research needs to be devised; just how complex this might be, for Iran alone, has already been foreseen by Scott (1975), with whose words I should like to conclude:

. . . complete protection should be strictly enforced until detailed studies have been conducted on the breeding and wintering ecology of the species, its migration patterns, and its population dynamics. Then it will be possible to determine the annual harvestable surplus, if any, which the populations could support on a sustained basis. If this surplus is deemed adequate, a very limited hunting season with strict bag limits could be considered. However, the requisite studies would require a large team of competent biologists and ecologists working in concert for a number of years. . . .
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