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M.O.S.

January-June 1977 **No. 18**

MALTA ORNITHOLOGICAL SOCIETY

P.O. Box 498, Valletta, Malta.

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- The Malta Ornithological Society was founded in 1962 to promote the scientific study of ornithology and bird conservation in the Maltese Islands. It organises a variety of scientific and social activities. It has its own ringing scheme, its own publications and a young members section.

- The Society consists of Life Members, Ordinary Members, Group Membership and Hon. Life Members. The Life Membership is £M30 and the annual subscription is £M1.50 (25c for a member under the age of 18 or receiving full-time education). All members are entitled to receive its bulletins gratis and to participate in its activities.

- Anyone wishing to apply for membership is welcome to write to the Hon. General Secretary – M.O.S. **P.O. Box 498, Valletta, Malta.**

- The Editor welcomes contributions treating any aspect of the Ornithology of the Maltese Islands and the Mediterranean for publication in this Bulletin.

IL-MERILL JANUARY – JUNE 1977 No. 18

REPORT ON BIRD-RINGING FOR 1975 AND 1976

by Joe Sultana & Charles Gauci

This ringing report covers the two-year period 1975-76 during which a total of 19,685 birds were ringed. Comparing this figure with that of the two previous corresponding years (1973-74) one notes an increase of 5,350 birds. This may be attributed to the increase in the number of ringers (13 at the end of 1976), as well as to the growing expertise and effort on the part of the few dedicated ones.

The number of birds ringed in 1975 and 1976 was 10,176 of 86 species and 9,509 of 90 species respectively; the former being the highest for one year since ringing was started in autumn 1965. There was a slight decrease in the total of 1976 (667 less than in 1975) but an increase of 4 in the number of species ringed. Since 1965 the grand total stands at 64,145 birds of 126 species as on 31.12.1976.

5 new species were added to the ringing list during 1975. These were Richard's Pipit, Rufous Bush Chat, Fieldfare, Brambling and Lapland Bunting; the last also being the first recorded for Malta. During 1976 only one species – Black-headed Gull – was added; however, there was a worthy addition of a new subspecies – the eastern race of the Collared Flycatcher *F.a. semitorquata* – which was also newly recorded for Malta. Rare visitors ringed included 2 Rustic Buntings, 2 Orphean Warblers and an Olivaceous Warbler.

With only about 13 resident species and 5 summer visitors, our ringing totals depend very much on the spring and autumn migrants as well as the winter visitors. As was expected the best months were again April and May and October and November, both the peaks of the migration in spring and autumn respectively. In the months of June and July, the almost total lack of ringed migrants was compensated by the number of ringed Storm Petrels (1,243 in 1975 and 460 in 1976) during 3 and 2 night visits respectively to Filfla Islet.

Though the pattern of migration is generally the same year after year, the numbers involved within a species of spring and autumn migrants and winter visitors fluctuate appreciably and depend to a large extent on the weather condition. Thus the total numbers of certain species of migrants are very variable from year to year. These changes (e.g. only 383 Swallows ringed in 1975 but 840 in 1976; 104 Great Reed Warblers ringed in 1975 while 61 were ringed in 1976) can be also explained by the fact that there are usually a few notable influxes of various species in spring and autumn which may either be totally missed or taken full advantage of by the ringers. The latter can only operate during their spare time, mainly during weekends.

Topping the list of birds ringed for both years we find the Robin with 1,584 and 1,381 respectively. In 1975 it was followed by the Storm Petrel (1,243), the Chiffchaff (986), the Blackcap (718), the Spanish Sparrow (690), the Garden Warbler (555), the House Martin (391), the Swallow (383), the Sardinian Warbler (365) and the Yellow Wagtail (317). The best totals in 1976 following that of the Robin were those of the Chiffchaff (1,108), the Swallow (840), the Spanish Sparrow (820), the Sardinian Warbler (531), the Garden Warbler (486), the Storm Petrel (460), the House Martin (319), the Wood Warbler (348) and the Subalpine Warbler (346). Topping the first 10 places in the grand total list at the end of 1976 we find 3 winter visitors (Robin 8,286, Chiffchaff 7,085 and Blackcap 2,114); 4 spring and autumn migrants (Swallow 6,041, Garden Warbler 3,129, Sand Martin 2,742 and House Martin 2,388); 2 resident species (Spanish Sparrow 4,515 and Sardinian Warbler 2,401); and 1 sum-

mer visitor (Storm Petrel, 7,937).

Being the highest since ringing started, the totals for 1975 and 1976 produced remarkable record totals for several species. Thus, the record totals in 1975 of the Cetti's Warbler (37), Sedge Warbler (111), Subalpine Warbler (298) and Wood Warbler (166) were bettered in 1976, reaching 43, 126, 346 and 348 respectively. (That of the Collared Flycatcher (26) was again repeated in 1976).

Record totals in 1975 which were not bettered in 1976 were: Cory's Shearwater – 154; Yellow Wagtail – 317; Dunnock – 89; Reed Warbler – 96; Great Reed Warbler – 104; Garden Warbler – 555; Blackcap – 718; Willow Warbler – 141; Pied Flycatcher – 150; Robin – 1584; Chaffinch – 57; and Reed Bunting – 18.

The record totals reached in 1976 were:
Manx Shearwater – 85; Scops Owl – 17; Tree Pipit – 133; Meadow Pipit – 62; Icterine Warbler – 91; Sardinian Warbler – 531; Spotted Flycatcher – 91; Stonechat – 83; Nightingale – 125; and Spanish Sparrow – 820.

Except for the Storm Petrel and the Shearwaters, most birds ringed in any number are small passerine species. Very few wader species were ringed (only 6 in 1975). Much effort on the part of two ringers produced 44 in 1976. Like most other species with the size of a Skylark or larger, waders are much harassed by local shooters. Furthermore, suitable wader-catching areas are restricted to Ghadira and a handful of small reservoirs in various valleys.

The main ringing sites during 1975 were Buskett/Wied il-Luq area, Salina, Girgenti, Mdina/Rabat area, Xemxija and Lunzjata. Other sites used were Ghadira, Wied Znuber/Hal Far, Targa Gap, Munxar and Ramla Valley. The same sites were again used in 1976 with the addition of the Marsa/Addolorata area and Sarraflu (Gozo).

The main part of this report is devoted to Ringing Recoveries. These are presented in two sections – (a) recoveries of birds ringed in Malta and (b) foreign ringed birds recovered in Malta. In both sections, recoveries in both years are treated together. In the recoveries of birds ringed in Malta, only those recovered at least 5km away from the ringing site are included – the list comprises 80 recoveries of 29 species. The most remarkable are a Manx Shearwater found dead in Greece, a Sand Martin controlled in Holland, 3 Swallows in Poland, Sweden and the Central African Republic respectively; a Great Reed Warbler controlled in East Germany, a 1975 spring Pied Flycatcher found dead in Spain in the autumn of 1976, and a Rustic Bunting (3rd for the ringing list) recovered on the island of Rhodes 11 days after it was ringed in October 1976. Other interesting recoveries were 4 Storm Petrels (Sicily and Ionian Sea); a Grey Wagtail, a Redstart and a Robin in Tunisia; a Starling, a Garden Warbler and 2 Song Thrushes in Italy; also a Robin in Algeria. Of the local movement recoveries 3 Cetti's Warblers reared in the Girgenti/Wied il-Luq area moved to Gozo presumably trying to colonize new areas for this recently established species. 5 Robins, 5 Chiffchaffs and 2 Swallows were among 21 recoveries of birds ringed in Malta and recovered in Gozo or viceversa. A migrating redstart was recovered within 5km of its ringing site in the subsequent season.

As in previous years there were many retraps. The most interesting were as usual those involving wintering species, mainly Chiffchaff, Robin and Blackcap, retrapped in subsequent winters. It is hoped that retraps, which do not figure in this report, will be treated together with those of previous years in a future issue of 'Il-Merill'.

The section of foreign-ringed birds recovered in Malta comprises 48 birds of 27 species. Some of these recoveries occurred previous to 1975 but only recently came to our notice. Of these foreign recoveries only a Sedge Warbler (ringed in Austria), 2 Blackcaps (one ringed in France and one in Norway) and a Pied Flycatcher (ringed in West Germany) were controlled by M.O.S. ringers. Details of the others were reported to us by various ringing schemes and by shooters or trappers who 'found' the ringed birds. Some were discovered in earlier reports of respective ringing schemes.

All these recoveries are remarkable. They include among others the first Gull-billed

Tern and the first Sanderling to be recovered in Malta (the latter was ringed in South Africa); 4 Ospreys (the 8th and 9th from Sweden and the 10th and 11th from Finland) bringing the total of 20 Ospreys recovered in Malta; the 3rd Marsh Harrier from Finalnd; and the 7th and 8th Caspian Tern from Sweden. An East German Dunlin, a Finnish Common Sandpiper, the 2nd Danish Cormorant and a Finnish Wryneck are also worthy of mention.

The M.O.S. Ringing Group started 1975 with 10 ringers, 3 of which J. Azzopardi, M.V. Gauci and C.A. Pomeroy, had just qualified for a ringing permit. The other ringers who had the ringing permit renewed from the previous year were S. Borg, V. Cilia, C. Gauci, T. Gauci, B.K. German, J. Grech and J. Sultana. By the middle of the year F. Smith brought the total number of ringers to 11. During their brief holiday in spring, B.T.O. ringers G. & J. Hirons, B. Evison and J. Gandy also helped in bird ringing. So did J.A. Hardman during his holiday in August.

In 1976 the Group again started with 10 ringers as C.A. Pomeroy left the islands. During the year S. Borg left the Ringing Group; however, two other members R. Cachia Zammit and M. Grima qualified for a ringing permit in March bringing up the total of ringers to 11. By the end of 1976 the number of ringers stood at 13. E. Mackrill, a B.T.O. ringer, working in Libya put up residence in Malta and joined the Group in the latter half of the year. F. Smith left the islands in December, while R.M. Holman and V. Sammut completed successfully their training to qualify for a ringing permit. Other trainees, mainly J. Attard Montalto, A.E. Baldacchino, D. Cachia, E. Curmi and R. Testa frequently helped the ringers during ringing activities.

The M.O.S. Executive Committee has lately entrusted the running of the M.O.S. Ringing Group in the hands of a Ringing & Research Committee which for the next two years is composed of J. Sultana – Ringing & Research Officer; C. Gauci – Ringing Secretary; M. Thake – Research Co-ordinator; J. Grech – Gozo Representative; R. Cachia Zammit – Committee's Secretary; and E. Curmi – Asst. Research Co-ordinator and Young Members Section Representative.

The Ringing and Migration Section of the British Trust for Ornithology continued to supply us with rings and handled our recoveries most efficiently. In addition to the B.T.O. rings, the M.O.S. also ordered Malta-addressed A (size 2.3) rings which were used for the first time in 1976 mostly on resident species and on some migrants.

On behalf of the M.O.S. we wish to express our thanks to Robert Spencer, the Senior Research Officer of the Ringing and Migration Section of the B.T.O. for his unfailing support. Grateful acknowledgement is made to the B.T.O. for the supply of rings at a reduced price and for handling all our recoveries. Acknowledgement is also extended to the Andrews Feed Malta Ltd. for a donation of £M100 and to the Bird Reserves Overseas Committee for a donation of £15. Thanks are also due to the foreign ringing schemes for informing us about recoveries in Malta and for sending their respective ringing reports; to the ringers and helpers of the M.O.S. Ringing Group; to all those who forwarded ringing details of recovered ringed birds; and to P. Geroudet (Switzerland), W. Thiede (Germany), W. Rydzewski (Poland), A. Keve (Hungary) and B. Massa (Sicily) for the information re certain recoveries.

During the past two years, C. Gauci, the Ringing Secretary was busy recording all the data of ringed and recovered birds in a meticulous manner and he was responsible for keeping the ringers informed by issuing a newsletter every other month.

With this report we prepared a map showing all past recoveries of Swallows, Sand Martins and House Martins, both those ringed in Malta and recovered overseas, as well as those foreign-ringed ones recovered in Malta.

RINGING AND RECOVERY TOTALS to 31.12.76

Species	Ringed in 1975	Ringed in 1976	Grand Total Ringed 1965-1976	Grand Total Recovered 1965-1976
Calonectris diomedea	154	49	538	11
Puffinus puffinus	19	85	181	1
Hydrobates pelagicus	1,243	460	7,937	20
Ixobrychus minutus	3	2	15	1
Falco tinnunculus	2	1	7	1
Coturnix coturnix	–	–	3	–
Rallus aquaticus	4	1	15	–
Porzana porzana	–	1	6	1
Porzana parva	–	–	4	–
Gallinula chloropus	8	–	21	2
Charadrius hiaticula	–	–	4	–
Charadrius dubius	–	–	27	1
Vanellus vanellus	–	–	1	–
Calidris minuta	–	33	133	3
Calidris temminckii	–	–	8	–
Calidris alpina	–	1	7	–
Calidris ferruginea	1	6	16	2
Philomacus pugnax	–	1	13	1
Tringa ochropus	–	1	9	3
Tringa glareola	–	–	43	6
Tringa hypoleucos	5	2	18	–
Gallinago gallinago	–	–	6	1
Gallinago media	–	–	1	1
Lymnocryptes minimus	–	–	1	–
Larus melanocephalus	–	–	1	–
Larus ridibundus	–	1	1	1
Larus argentatus	1	3	13	1
Streptopelia turtur	1	2	20	4
Cuculus canorus	1	–	8	–
Otus scops	9	17	70	3
Caprimulgus europaeus	–	4	11	1
Apus apus	–	–	2	–
Alcedo atthis	2	5	30	5
Upupa epops	–	–	6	–
Jynx torquilla	19	26	152	1
Riparia riparia	250	272	2,742	16
Hirundo rustica	383	840	6,041	45
Hirundo daurica	3	1	19	1
Delichon urbica	391	359	2,388	7
Calandrella cinerea	19	4	86	1
Lullula arborea	1	–	2	–
Alauda arvensis	4	–	20	4
Anthus novaeseelandiae	1	–	1	–
Anthus campestris	–	–	5	–
Anthus trivialis	72	133	497	1

Anthus pratensis	49	62	265	2
Anthus cervinus	—	2	4	—
Motacilla flava	317	111	1,227	17
Motacilla cinerea	25	41	305	5
Motacilla alba	17	32	181	5
Lanius collurio	3	5	44	—
Lanius senator	8	9	72	—
Oriolus oriolus	14	6	53	2
Sturnus vulgaris	28	3	46	4
Troglodytes troglodytes	1	—	15	—
Prunella modularis	89	58	372	3
Cettia cetti	37	43	158	7
Locustella luscinioides	—	5	16	—
Locustella fluviatilis	—	—	1	—
Locustella naevia	—	—	2	—
Lusciniola melanopogon	6	1	33	—
Acrocephalus schoenobaenus	111	126	504	1
Acrocephalus palustris	—	—	3	—
Acrocephalus scirpaceus	96	80	459	—
Acrocephalus arundinaceus	104	61	482	2
Hippolais icterina	84	91	383	—
Hippolais pallida	1	—	2	—
Sylvia nisoria	—	—	1	—
Sylvia hortensis	1	1	3	—
Sylvia borin	555	486	3,129	5
Sylvia atricapilla	718	252	2,114	7
Sylvia communis	122	78	834	—
Sylvia curruca	—	6	16	—
Sylvia ruppelli	—	1	2	—
Sylvia melanocephala	365	531	2,401	9
Sylvia cantillans	298	346	1,721	—
Sylvia conspicillata	52	94	354	1
Sylvia undata	7	1	24	—
Phylloscopus trochilus	141	139	921	1
Phylloscopus collybita	986	1,108	7,085	16
Phylloscopus bonelli	13	13	55	—
Phylloscopus sibilatrix	166	348	1,086	—
Regulus regulus	17	2	47	—
Regulus ignicapillus	17	12	118	1
Cisticola juncidis	9	57	93	3
Ficedula hypoleuca	150	99	616	2
Ficedula albicollis	26	26	95	—
Ficedula parva	1	5	20	—
Muscicapa striata	71	91	395	2
Saxicola rubetra	29	12	173	—
Saxicola torquata	72	83	383	2
Oenanthe oenanthe	2	7	69	—
Oenanthe hispanica	—	1	2	—
Oenanthe isabellina	—	—	1	—
Cercotrichas galactotes	2	—	2	—
Monticola saxatilis	—	2	3	—
Monticola solitarius	1	3	34	3

Phoenicurus ochruros	10	1	24	–
Phoenicurus phoenicurus	162	153	1,054	2
Erithacus rubecula	1,584	1,381	8,286	117
Luscinia megarhynchos	94	125	689	1
Luscinia luscinia	–	1	2	–
Luscinia svecica	2	3	29	–
Turdus pilaris	1	–	1	–
Turdus torquatus	–	–	3	–
Turdus merula	19	11	99	11
Turdus iliacus	9	4	19	–
Turdus philomelos	43	53	325	21
Remiz pendulinus	–	–	2	1
Passer hispaniolensis	690	820	4,515	64
Passer montanus	11	16	71	–
Passer mont. x hisp.	1	–	1	–
Fringilla coelebs	57	54	229	4
Fringilla montifringilla	1	2	3	–
Serinus serinus	21	11	112	4
Carduelis chloris	1	1	252	18
Carduelis spinus	2	–	3	–
Carduelis carduelis	–	5	6	–
Acanthis cannabina	23	3	851	53
Carpodacus erythrinus	–	–	1	–
Emberiza calandra	18	13	69	–
Emberiza citrinella	–	–	1	–
Emberiza hortulana	–	–	2	–
Emberiza rustica	1	1	3	1
Emberiza schoeniclus	18	1	25	–
Calcarius lapponicus	1	–	1	–
Totals	**10,176**	**9,509**	**64,152**	**543**

RINGING RECOVERIES

This section deals with 80 recoveries of 29 species during 1975-76 in the Maltese Islands. Only those recovered at least 5km away from the ringing site are included, except for 1 *Phoenicurus phoenicurus*, which, though recovered within the limit of 5km, was recovered in the subsequent year. For local recoveries the approximate distance covered and direction are given.

Key to symbols and terms used in the recovery list

Arrangement of entry: recoveries are arranged by species, and within the species usually by the date of recovery. Ringing details are given on the first line and recovery data on the second.

Ring number : where this is followed by an asterisk (*) the ring has been returned.

Age code : 1 = pullus; young bird ringed in the nest.
1J = fledged, but flying so weakly that it is obviously incapable of having travelled far from the nest.
2 = fully grown; year of hatching quite unknown.
3 = definitely hatched during current calendar year.
3J = definitely hatched during current calendar year and still partly or completely in juvenile body plumage.
4 = hatched before current calendar year; exact year unknown.
5 = definitely hatched during last calendar year.
6 = hatched before last calendar year; exact year unknown.

(a number in brackets beside the age code 1 indicates the size of the brood)

Sex : M = male
F = female

Manner of recovery : v = caught or trapped, and released with ring.
+ = shot or killed by man.
x = found dead or dying.
() = caught or trapped alive and not released, or released but with ring removed.
/?/ = manner of recovery unknown.

Date of recovery : where this is unknown the date of the reporting letter is given instead and is shown in brackets. An 00 in the date indicates that the exact day or month are unknown.

Co-ordinates of ringing sites omitted from text:

Filfla – 35°47′N, 14°25′E
L-Ahrax Pt. – 35°58′N, 14°23′E
Ramla Valley, Gozo – 36°03′N, 14°17′E
Lunzjata, Gozo – 36°03′N, 14°14′E
Valletta – 35°54′N, 14°32′E
Girgenti – 35°51′N, 14°25′E
Wied il-Luq/Buskett – 35°51′N, 14°26′E
Wied Znuber/Hal Far – 35°49′N, 14°31′E

Cory's Shearwater *Calonectris diomedea*

FS 00.655	4	06.08.73	Filfla.
	+	(05.04.75)	Mellieha Bay (20 km N).
SS 92.734	4	14.06.70	ibidem.
	v	28.06.76	ca. 9.5 km off Munxar Reef.
FV 05.034	4	07.06.75	ibidem.
	v	28.06.76	ca. 9.5 km off Munxar Reef.
FV 05.205	4	10.06.76	ibidem.
	v	28.06.76	ca. 9.5 km off Munxar Reef.
FV 05.206	4	10.06.76	ibidem.
	v	28.06.76	ca. 9.5 km off Munxar Reef.

Manx Shearwater *Puffinus puffinus*

EB 68.806	4	21.05.76	L-Ahrax Point, Mellieha.
	x	18.07.76	Lagonisi: ca. 37°50′N, 23°45′E (Attiki) **Greece.**

Storm Petrel *Hydrobates pelagicus*

214.8353	4	28.06.73	Filfla.
	+	15.04.75	Ionian Sea: ca. 38°30′N, 17°00′E **Italy.**
212.6117	4	06.08.73	ibidem.
	+	15.04.75	ca. 25 km off Syracuse: ca. 36°55′N, 15°25′E **Sicily, Italy.**
212.0540	4	27.05.72	ibidem.
	+	27.04.75	Lago di Siracusa: 37°04′N, 15°16′E **Sicily, Italy.**
697.638	4	13.06.70	ibidem.
	v	10.07.71	loco.
	+	29.07.76	Southern Ionian Sea, off Syracuse: 37°04′N, 15°17′E **Sicily, Italy.**
212.0052	4	27.05.72	ibidem.
	v	16.08.76	off Delimara Pt. (ca. 15 km ENE).
214.8758	4	28.06.75	ibidem.
	v	16.08.76	off Delimara Pt. (ca. 15 km ENE).

Turtle Dove *Streptopelia turtur*

DS 40.369	4	25.04.75	Mosta.
	()	27.04.75	Zejtun (8 km ESE).

Sand Martin *Riparia riparia*

KA 95.812	4	02.05.75	Ramla Valley, Gozo.
	v	12.07.75	Stellendam, Overflakkee: 51°48′N, 04°02′E (Zuid Holland) **Netherlands.**
(re-ringed Arnhem) S815350			

Swallow *Hirundo rustica*

KA 35.207	4	01.04.75	Lunzjata Valley, Gozo.
	v	02.04.75	Mriehel (24 km SE).
JH 84.620	4 F	01.04.72	Ramla Valley, Gozo.
	x	(22.04.75)	Gnien il-Kbir, Rabat (22 km SSE).
JX 03.427	3	19.09.74	Lunzjata, Gozo.
	v	24.04.76	Pilawa Gorna, Walbrzych: 50°41'N, 16°45'E (Wroclaw) **Poland.**
KC 30.133	4 M	23.04.76	Targa Gap, Mosta.
	v	25.04.76	Sta. Lucia (11 km SE).
KA 95.977	4 F	09.05.75	Ramla Valley, Gozo.
	x	10.08.76	Algsjo, Asele: 64°12'N, 17°30'E (Vasterbotten) **Sweden.**
KA 96.348	4 M	26.03.76	Lunzjata, Gozo.
	()	(04.11.76)	Boda: 04°19'N, 17°26'E **Central African Republic.**

House Martin *Delichon urbica*

KA 35.224	4	01.04.75	Lunzjata, Gozo.
	v?	04.04.75	Rabat (24 km SE).

Skylark *Alauda arvensis*

BS 45.120	2 M	27.10.75	Hal Far.
	+	08.11.75	B'Kara (10 km NW).

Yellow Wagtail *Motacilla flava*

KB 84.803	3	10.09.75	Girgenti.
	()	11.09.75	Mriehel (5 km ENE).
KB 84.784	3	10.09.75	ibidem.
	()	12.09.75	nr. Luqa (8 km E).
KB 84.844	3	12.09.75	ibidem.
	()	ca 13.09.75	Ghaxaq (9 km E).
KB 84.840	3	12.09.75	ibidem.
	v	13.09.75	Qormi (6 km NE).
KC 27.079	3	26.09.76	ibidem.
	v	28.09.76	Wied is-Sewda (6 km NE).

Grey Wagtail *Motacilla cinerea*

JK 31.551	4 M	23.10.72	Lunzjata, Gozo
	/?/	(29.12.75)	Mahdia: 35°29'N, 11°03'E **Tunisia.**

Starling *Sturnus vulgaris*

CH 89.953	4 M	01.03.75	Valletta.
	+	29.01.76	Castorano, San Benedetto: 42°54'N, 13°43'E (Ascoli Piceno) **Italy.**

Dunnock *Prunella modularis*

Valletta	2	01.11.76	Lunzjata, Gozo.
00.050	v	07.11.76	L-Iklin, B'Kara (23 km SE).

Cetti's Warbler *Cettia cetti*

KA 95.911	1J	18.05.75	Xemxija.
	v	03.11.75	Ramla Bay, Gozo (17 km NW).
KC 29.629	3 F	10.07.76	Wied il-Luq, Buskett.
	v	30.10.76	Ghajn Barrani, Gozo (27 km NNW).
KC 26.996	3 M	10.09.76	Girgenti.
	v	30.10.76	Ghajn Barrani, Gozo (30 km NNW).

Great Reed Warbler *Acrocephalus arundinaceus*

BR 79.935	4	26.08.75	Girgenti.
	v	04.07.76	Bärenbrück: 51°49'N, 14°28'E (Cottbus) **East Germany.**

Garden Warbler *Sylvia borin*

HX 94.934	3	12.09.70	Wied il-Luq, Buskett.
	+	31.08.75	Seminara: 38°19'N, 15°52'E (Reggio di Calabria) **Italy.**

Blackcap *Sylvia atricapilla*

JV 15.332	5 M	19.01.75	Salina.
	v	22.03.75	Buskett (9 km S).
HX 76.315	4 M	24.03.70	Ghadira.
	v	26.03.75	Mdina (10 km SE).
KA 34.071	4 F	18.01.75	Buskett.
	v	06.04.75	Xemxija (10 km NNW).

Sardinian Warbler *Sylvia melanocephala*

KC 31.168	3J	16.05.76	Hal Far.
	( )	17.10.76	Qormi (8 km NW).

Chiffchaff *Phylloscopus collybita*

162.830	2	24.11.74	Lunzjata, Gozo.
	v	29.03.75 & 15.11.75	Girgenti (24 km SE).
765.362	2	16.11.74	Salina.
	v	03.01.76 & 08.02.76	Lunzjata (19 km WNW).
826.886	2	15.12.74	Lunzjata.
	v	07.03.76	nr. Paola (30 km SE).
952.279	4	10.01.76	Hal Far.
	v	21.11.76	Lunzjata (35 km NW)

826.394	2	11.11.74	Lunzjata.
	v	27.11.76	Birzebbugia (35km SE).
826.173	2	20.11.74	Xemxija.
	v	11.12.76	Addolorata Cemetry, Paola (13 km SE).

Fan-tailed Warbler *Cisticola juncidis*

962.417	1(5)	12.06.76	Ghadira.
	x	00.08.76	Dingli (13 km SSE).

Pied Flycatcher *Ficedula hypoleuca*

KA 34.885	5 M	19.04.75	Girgenti.
	x	02.10.76	Rincon de Soto, Calahorra: 42°15'N, 01°50'W (Logrono) **Spain.**

Stonechat *Saxicola torquata*

JX 60.387	3 M	03.11.74	Lunzjata.
	+	09.01.75	Wied is-Sewda (25km SE).

Redstart *Phoenicurus phoenicurus*

JX 59.402	2 F	15.09.74	Girgenti.
	v	27.03.75	Rabat.
KA 96.537	4 M	20.04.75	Wied Znuber, Hal Far.
	x	10.04.76	Ouled Mansour: 34°15'N, 09°32'E (Gafsa) **Tunisia.**

Robin *Erithacus rubecula*

JV 15.698	4	04.11.74	Wied Znuber, Hal Far.
	v	06.02.75	Girgenti (10 km WNW).
KB 84.530	2	03.10.75	Wied Znuber, Hal Far.
	()	15.10.75	Gharghur (26 km NNW).
KB 84.576	2	23.10.75	Xemxija.
	()	01.11.75	Ta' Qali (6 km SE).
KC 26.340	2	29.10.75	Rabat.
	()	02.11.75	Hagar Qim (14km SE).
KC 26.306	3	27.10.75	Rabat.
	v	03.11.75	Nadur, Gozo (20 km NNW).
KB 85.448	3	11.10.75	Xemxija.
	v	12.11.75	Ghajnsielem, Gozo (12km NW).
KB 85.040	3	25.10.75	Girgenti.
	v	31.12.75	Victoria, Gozo (27 km NW).
KC 30.994	3	10.10.76	Lunzjata.
	()	25.10.76	Tas-Santi (15km SSE).
KH 80.651	3	24.10.76	Lunzjata.
	v	30.10.76	Birzebbugia (35km SE).

KC 31.691	3	10.10.76	Xemxija.
	v	31.10.76	Siggiewi (10 km SSE).
KH 80.111	3	23.10.76	Xemxija.
	()	31.10.76	Hamrun (11 km SE).
KC 31.975	3	20.10.76	Rabat.
	()	00.10.76	Zurrieq (10 km SE).
KB 85.576	3	07.10.75	Rabat.
	()	(13.11.76)	Mgarr (5 km NW).
KB 85.677	3	24.10.75	Rabat.
	()	(13.11.76)	Mgarr (5 km NW).
KC 31.486	2	11.09.76	Wied il-Luq.
	()	21.11.76	Qormi (6 km ENE).
JP 08.272	3	12.10.73	Wied Znuber.
	x	23.11.76	Mgarr (17 km NW).
KB 85.763	5	19.03.76	Buskett.
	x	25.12.76	Sidi Thabit: 36°54'N, 10°03'E **Tunisia.**
KC 26.903	3	12.12.75	Girgenti.
	()	(19.11.76)	Senglea (9 km ENE).
KC 26.044	3	23.10.75	Xemxija.
	+	26.12.76	Taguemount: 36°30'N, 04°08'E (Alger) **Algeria.**

Blackbird *Turdus merula*

XA 99.060	3 M	01.11.75	Wied Znuber.
	()	09.02.76	Mellieha (17 km NW).

Song Thrush *Turdus philomelos*

CV 55.481	4	07.02.71	Buskett.
	+	(28.02.75)	Cropalati: 39°31'N, 16°44'E (Cosenza) **Italy.**
CP 66.988	2	26.10.73	San Anton Gardens.
	+	02.02.76	Matera: 40°40'N, 16°36'E **Italy.**
XA 99.070	3	24.10.76	Rabat.
	+	00.10.76	Zurrieq (10 km SE).

Penduline Tit *Remiz pendulinus*

JX 59.829	4	30.11.74	Lunzjata.
	()+	00.03.75	Burmarrad (19 km SE).

Chaffinch *Fringilla coelebs*

JX 60.704	4 M	19.11.74	Ghadira.
	()	ca 03.03.75	Paola (16 km SE).
KC 26.322	3 M	28.10.75	Rabat.
	v	02.11.75	Wied il-Balluta (9 km NE).

Linnet *Acanthis cannabina*

JK 31.964	2 F	17.11.72	Mosta.
	()	00.10.75	Fomm ir-Rih (7 km W).
JX 59.759	2 F	11.11.74	Lunzjata.
	()	00.10.75	Fomm ir-Rih (16 km SSE).
JK 31.476	2 F	04.11.72	ibidem.
	()	00.10.75	Fomm ir-Rih (16 km SSE).

Rustic Bunting *Emberiza rustica*

KH 80.580	3 M	13.10.76	Lunzjata.
	+	24.10.76	Rhodes: 36°26′N, 28°14′E **Greece.**

FOREIGN RINGED BIRDS RECOVERED IN MALTA

This section deals with 48 foreign ringed birds of 27 species recovered in Malta. Some of these were recovered previous to the two-year period (1975-76) covered by this report, but they only came to our notice lately.

The symbols and terms are the same as those used in the Ringing Recoveries. A number in brackets beside the age code 1 indicates the size of the brood.

Cormorant *Phalacrocorax carbo*

Copenhagen 3009	1	07.06.75	Vorso, Horsens Fjord: 55°52′N, 10°01′E (Jutland), **Denmark.**
	+	13.11.76	Marsaxlokk: 35°51′N, 14°33′E.

Night Heron *Nycticorax nycticorax*

Zagreb C 229.924	4	10.06.69	Bilje: 45°37′N, 18°43′E (Hrvatska) **Yugoslavia.**
	+	16.10.72	S.E. Malta: ca. 35°54′N, 14°28′E.

Grey Heron *Ardea cinerea*

Gdansk B 2484	1	27.07.34	Bielewo: 57°57′N, 16°56′E (Koscian) **Poland.**
	v	19.10.51	on board of a ship off Malta.

Purple Heron *Ardea purpurea*

Zagreb D 116.026	1	24.06.75	Apatin: 45°38′N, 18°58′E (Vojvodina) **Yugoslavia.**
	+	09.09.75	Gharghur: 35°56′N, 14°27′E.

Osprey *Pandion haliaetus*

Stockholm 9.207.286	1	30.06.67	Rodskar: 59°31'N, 16°56'E (Vastmanland) **Sweden.**
	+	00.10.67	Tal-Handaq: 35°52'N, 14°28'E.
Stockholm 9.211.920	1(3)	23.06.74	Hasthall, Vastermo: 59°20'N, 16°04'E (Sodermanland) **Sweden.**
	+	00.09.74	Buskett: 35°51'N, 14°26'E.
Helsinki M – 9.292	1	04.07.74	Kangasala: 61°20'N, 24°00'E (Hame) **Finland.**
	+	00.09.74	Zebbiegh: 35°55'N, 14°23'E.
Helsinki M – 9.022	1	01.07.75	Tammisaari mlk: 59°50'N, 23°00'E (Uusimaa) **Finland.**
	+	30.09.75	Malta: ca. 35°55'N, 14°28'E.

Marsh Harrier *Circus aeruginosus*

Helsinki H – 108.110	1	06.07.73	Kymi: 60°33'N, 26°52'E (Laani) **Finland.**
	+= F·ca	15.04.74	Siggiewi: 35°51'N, 14°26'E.

Kestrel *Falco tinnunculus*

Helgoland 576.710	3	04.07.35	Garmisch-Partenkirchen: 47°30'N, 11°06'E (Oberbayern) **Germany.**
	+	18.10.35	Marsa: 35°49'N, 14°32'E.
Helgoland 48.300	3	02.07.35	Proskau: 50°35'N, 17°52'E, Kr. Oppeln, Polen, **Germany.**
	+	08.04.39	Xaghra, Gozo: 36°03'N, 14°15'E.

Quail *Coturnix coturnix*

Bologna S 49.195	/?/	20.04.72	Fano: 43°50'N, 13°01'E **Italy.**
	+	00.04.74	Ramla Bay (Gozo): 36°03'N, 14°17'E.

Dunlin *Calidris alpina*

Hiddensee 80.255.299	4	10.08.76	Langenwerder: 54°02'N, 11°30'E (Wismar) **E. Germany.**
	+	20.10.76	Ta' Qali: 35°54'N, 14°25'E.
Praha Z 477.487	3 +	10.09.75	Senné: 48°40'N, 22°02'E (Michalovca) **Czechoslovakia.**
		29.09.76	Xghajra: 35°53'N, 14°32'E (Zabbar).

Sanderling *Calidris alba*

Pretoria BB 12.755	4	08.02.75	Oliphant's River mouth: 31°42'S, 18°12'E (Cape) **South Africa.**
	+	22.05.75	Marsascala: 35°52'N, 14°34'E.

Common Sandpiper *Tringa hypoleucos*

Helsinki P -- 289.603	3	12.08.72	Espoo: 60°09'N, 24°44'E (Uusimaa) **Finland.**
	+	00.05.73	Salina: 35°57'N, 14°25'E.

Mediterranean Gull *Larus melanocephalus*

Moskwa E 162.714	3	02.07.49	Orlov Isles: 46°17'N, 31°45'E (Tendrovskii Bay) **U.S.S.R.**
	+	early 1950	Valletta: 35°54'N, 14°31'E.
Moskwa M 259.329	3	19.06.75	Smalenyi Island: 46°15'N, 32°00'E (Tendra Bay) **U.S.S.R.**
	+	00.10.75	Malta.

Black-headed Gull *Larus ridibundus*

Budapest 130.429	1	28.05.61	Zzeged-Feherto: 46°20'N, 20°05'E **Hungary.**
	+	08.04.62	Tarxien: 35°52'N, 14°32'E.
Budapest 152.181	1	07.06.64	ibidem.
	+	15.01.65	Birkirkara: 35°54'N, 14°28'E.
Moskwa M -- 183.815	1	15.07.74	Engure Lake: 57°17'N, 23°07'E **Latvian S.S.R.**
x (fishing net)		06.01.75	off Dingli Cliffs: 35°50'N, 14°22'E.

Gull-billed Tern *Gelochelidon nilotica*

Viborg S 28.439	1	11.06.58	Aggersborrggaard: 57°00"N, 09°16'E (N. Jylland) **Denmark.**
	+	06.04.63	Zurrieq: 35°58'N, 14°28'E.

Caspian Tern *Hydroprogne tschegrava*

Stockholm 7.055.063	1	16.06.73	Klyndroma, Graso: 60°27'N, 18°35'E (Uppland) **Sweden.**
	+	24.08.75	Malta: ca. 35°55'N, 14°30'E.
Stockholm 7.059.183	1	12.06.75	Dansskaren: 58°06'N, 16°54'E (Ostergotland) **Sweden.**
	+	08.09.75	Ramla Bay (Gozo): 36°03'N, 14°16'E.

Wryneck *Jynx torquilla*

Helsinki A 286.783	2	25.08.65	Tampere: 61°29'N, 23°50'E (Iidesjarvi) **Finland.**
	()	31.10.65	Marsascala: 35°52'N, 14°34'E.

Sand Martin *Riparia riparia*

Copenhagen 9.193.305	4	21.07.68	Munkeby: 54°57'N, 11°12'E (Lolland) **Denmark.**
	v	19.09.69	Mgarr: 35°55'N, 14°22'E.

Swallow *Hirundo rustica*

Sempach 527.909	3 F	30.07.60	Pointe-à-la-Bise: 46°12'N, 06°10'E (Genève) **Switzerland.**
	+	02.05.61	Gozo: 36°03'N, 14°14'E.
Hiddensee 90.262.338	1	03.08.72	Pirna: 50°57'N,13°57'E (Bezirk Dresden) **E. Germany.**
	+	00.04.73	Birkirkara: 35°54'N, 14°28'E.

Yellow Wagtail *Motacilla flava*

London JX 01.344	3 M	23.09.74	Dragonada: 35°20'N, 26°10'E **Crete.**
	()	ca. 12.04.76	Qormi: 35°53'N, 14°28'E.

Starling *Sturnus vulgaris*

Paris GD 15.495	/?/	17.12.73	Haffouz, Kairouan: 35°58'N, 09°41'E **Tunisia.**
	x(+)	30.10.75	Luqa: 35°52'N, 14°29'E.

Sedge Warbler *Acrocephalus schoenobaenus*

Radolfzell BP 71.695	3	20.09.76	Illmitz, Bez Neusiedl: 47°46'N, 16°48'E (Burzenland) **Austria.**
	v	16.10.76	Ramla Valley: 36°03'N, 14°17'E.

Blackcap *Sylvia atricapilla*

Paris 1.781.567	/?/	10.04.74	St. Bauzile che de Mende: 44°31'N, 03°30'E (Lozère) **France.**
	v=4 M	15.03.75	Mdina: 35°53'N, 14°24'E.
Stavenger 9.399.342	3 M	06.10.75	Jomfruland, Kragero: 58°53'N, 09°37'E (Telemark) **Norway.**
	v	25.10.75	Wied il-Luq, Buskett: 35°51'N, 14°26'E.

Pied Flycatcher *Ficedula hypoleuca*

Helgoland 9 H 07.485	1	04.06.72	Braunschweig: 52°22'N, 11°01'E (Niedersachsen) **W. Germany.**
	v=M	11.04.76	Rabat: 35°53'N, 14°24'E.

Chaffinch *Fringilla coelebs*

Bologna L 57.035	2	16.11.70	Pozzuolo Castro: 45°36'N, 10°31'E (Polpenazze) **Italy.**
	()	00.11.72	Sannat (Gozo): 36°01'N, 14°15'E.

Serin *Serinus serinus*

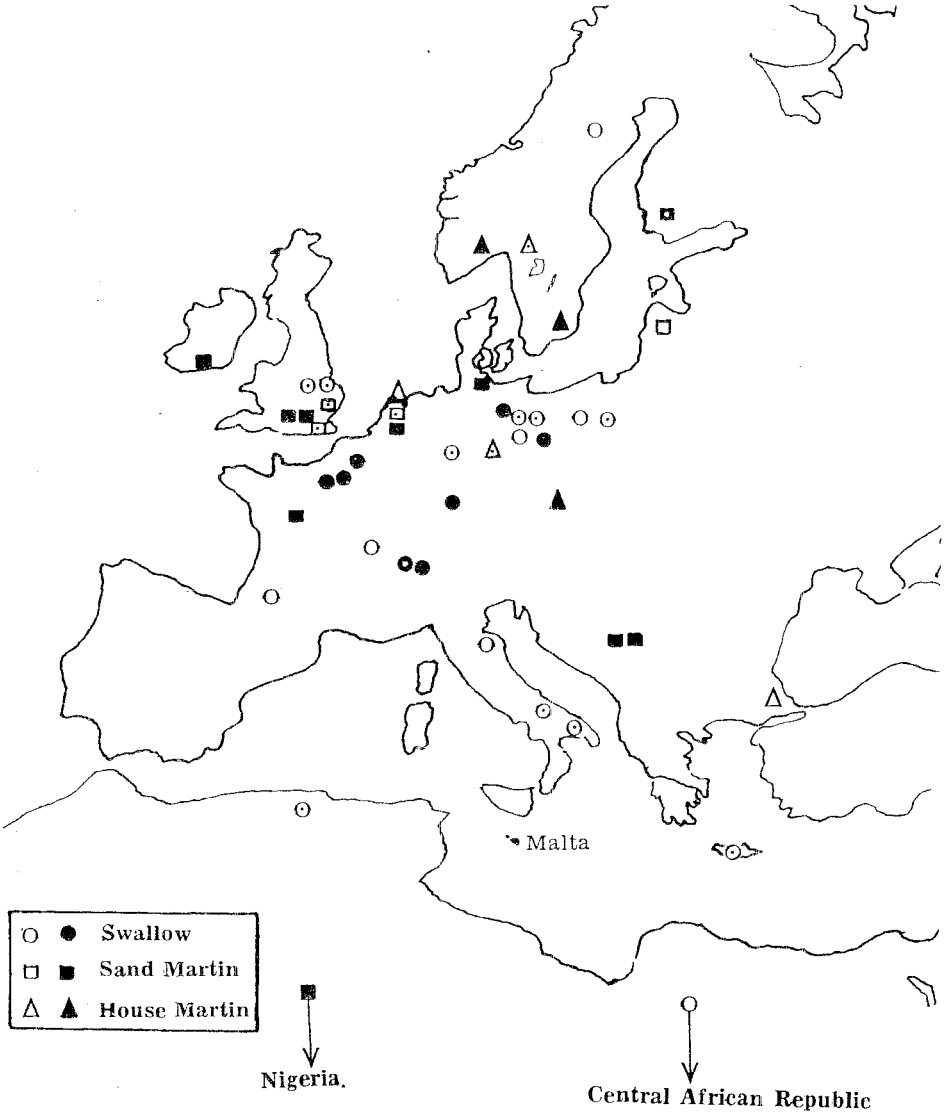
Ljubljana 71.566	2 M	18.10.75	Ljubljana: 46°03'N, 14°30'E **Yugoslavia.**
	()	28.12.76	Safi: 35°50'N, 14°29'E.

Siskin *Carduelis spinus*

Ljubljana 43.084	2 F	06.10.74	Zalog: 46°03'N, 14°37'E **Yugoslavia.**
	()	00.10.74	Malta.
Praha M 677.414	4	19.10.73	Breclav: 48°46'N, 16°53'E **Czechoslovakia.**
	()	00.10.75	Ta' Xbiex: 35°54'N, 14°30'E.
Moskwa XA 184.040	2 M	15.09.75	Liepaya District, near Pape: 56°09'N, 21°02'E **Latvian S.S.R.**
	/?/	15.12.75	Ghaxaq: 35°51'N, 14°31'E.
Ljubljana 59.424	2 F	04.10.75	Zalec/Celje: 46°15'N, 15°10'E **Yugoslavia.**
	()	05.11.75	Cospicua: 35°53'N, 14°31'.

Linnet *Acanthis cannabina*

Praha M 422.173	3	20.07.62	Trnava: 48°22'N, 17°35'E **Czechoslovakia.**
	()	07.11.62	Birkirkara: 35°53'N, 14°27'E.
Sempach A 135.513	3 F	04.10.72	Col de Bretolet/VS: 46°02'N, 06°08'E **Switzerland.**
	()	15.10.72	Kercem, Gozo: 36°02'N, 14°13'E.
Bologna L 465.252	4 F	04.04.74	Porto S. Giorgio: 43°11'N, 13°48'E **Italy.**
	()	end 10.74	Luqa: 35°57'N, 14°29'E.
Praha M 617.399	2 F	05.05.71	Topol'cany: 48°34'N, 18°10'E **Czechoslovakia.**
	()	20.03.75	Ghar Lapsi: 35°50'N, 14°25'E.
Bologna L 139.407	4 M	19.04.73	Via Litoranea Humana: 43°30'N, 13°36'E **Italy.**
	()	16.03.75	Delimara: 35°49'N, 14°34'E.
Bologna L 455.098	2 F	28.04.74	Marina, Massignano: 43°03'N, 13°48'E **Italy.**
	()	04.11.75	St. Andrew's: 35°56'N, 14°29'E.
Bologna L 465.043	2	02.04.74	Porto S. Giorgio: 43°11'N, 13°48'E **Italy.**
	()	21.03.76	Kercem (Gozo): 36°02'N, 14°12'E.
Budapest 189.029	3	20.07.74	Piliscsaba: 47°38'N, 18°50'E **Hungary.**
	()	00.11.76	Malta: ca. 35°54'N, 14°28'E.



Recoveries of hirundine species *Hirundo rustica*, *Riparia riparia* and *Delichon urbica*. The open symbols indicate recoveries of Malta-ringed birds. Solid symbols indicate foreign-ringed birds recovered in Malta. All recoveries effected during the same season as their ringing have symbol marked with a dot.

SYNOPTIC SCALE WEATHER AND HONEY BUZZARD (PERNIS APIVORUS) MIGRATION ACROSS THE CENTRAL MEDITERRANEAN

by Martin Thake

Honey Buzzards regularly make long sea-crossings while on migration across the Central Mediterranean (Ref. 1, 5, 6, 7.) but little is known, however, about the conditions under which these crossings are made and the flight-styles employed.

SOARING

Cross-country soaring is commonly employed by broad-winged raptors migrating overland. Thermals of sufficient strength to be used by such raptors are relatively uncommon over the sea. In September, the Central Mediterranean is still fairly warm. Influxes of cool air (chiefly maritime polar and continental polar) frequently result in conditions of convective instability. There are, however, no reports of Honey Buzzards using cellular convective currents over the sea. There is only one definite reference to Honey Buzzards using the thermals which precede the thunder-storms of cold fronts (*Gibb 1951; Ref. 2*). In this study, only a small minority of the Honey Buzzards were sighted during the passage of a frontal system and a similar proportion was observed by Beaman and Galea (*pers. comm.*). Although in a few cases the birds' behaviour appeared to be opportunistic, in most cases they seemed to be trying to avoid the front. Gibbs' observations of Honey Buzzards that '... accompanied even those storms which were temporarily travelling northwards over Malta ...' in September certainly do not suggest opportunistic behaviour. (*Ref. 2: p. 118*)

There are several reasons why avoidance behaviour would be adaptive. The downdraughts in a thunder-storm often reach 10 m/sec. and are frequently accompanied by very intense precipitation. The very adaptions which allow raptors to utilize rising air-currents make thunder-storms particularly hazardous to members of this order. The use of the thermals ahead of a frontal system, although feasible, is rendered dangerous by the fact that the wind just ahead of the frontal surface has a strong component directed toward it. It would be less risky for raptors to utilize the unstable maritime polar air-streams which usually follow the front. The winds are usually in the north-westerly quadrant (i.e. virtually tail-winds in autumn) and thermals abound. Yet most sightings associated with frontal systems have occurred ahead of the front and the few raptors sighted in this study after the passage of fronts were flying away from them, often against the wind.

On 11/9/76, a large influx of Honey Buzzards was observed during the approach of a cold front from the West. 109 Honey Buzzards were sighted, mostly between 14.00 and 17.00 hrs. CET. All the birds sighted remained in the general vicinity of the wooded valley of Buskett and birds started attempting to roost at 15.00 hours CET. Moreover, the mean party size was significantly greater than that usually observed (*Fig. 1.*). This may be explained as follows: Parties of Honey Buzzards frequently coalesce. If we assume that this occurs with constant probability and that parties do not break up once formed, mean party-size would depend on mean distance covered across the path of other birds. If on sighting a front, Honey Buzzards head away from it, as the latter almost always travel eastwards, birds flying to the west of the Maltese Islands would often cross the path of those flying further east, increasing the likelihood of parties coalescing. Mean party size would consequently increase.

In view of the above, it seems unlikely that raptors flying ahead of fronts are using frontal systems to cross the Mediterranean. Rather, the birds appear to recognize the approach of an active frontal system as a potentially dangerous situation and make for the nearest land.

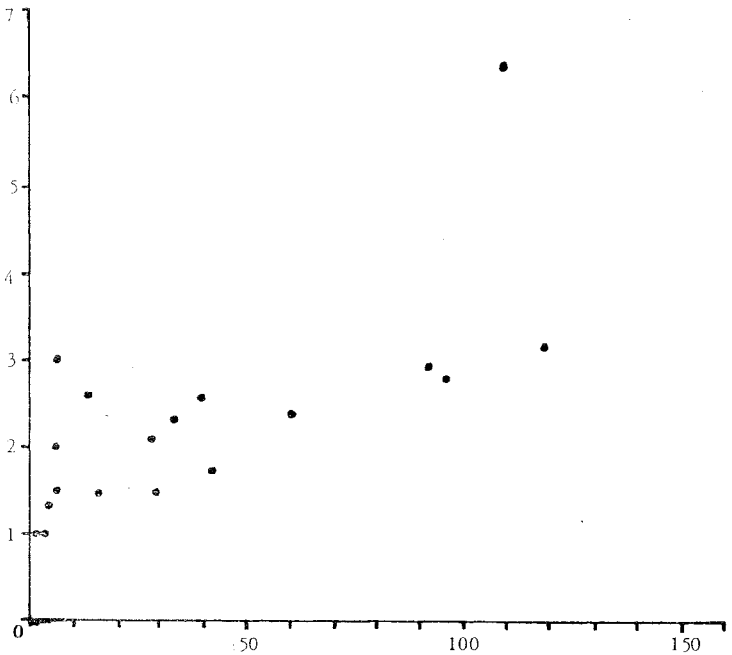


Fig. 1 Variation of mean party size with numbers of *P. aviporus* sighted on the same day. The spurious point (109, 6.4) is that obtained on 11/9/76 (P approx .01)

FLAPPING FLIGHT

Sustained flapping flight has frequently been observed in migrant Honey Buzzards crossing wide stretches of water (*Beaman et al in prep.*). This method is the least economical in terms of power requirements but a Honey Buzzard employing flapping flight to cross the Mediterranean can maximise its safety by appropriate selection of the weather conditions under which it migrates.

(1) The main purpose of this section is to justify the search for any correlation between weather and the numbers of raptors observed at Buskett.

The following hypothesis was tested: The raptor counts made at Buskett are random samples of a homogeneous, normally distributed, population, i.e. the probability of a raptor sighted belonging to a given species is constant.

Beaman and Galea (*Ref. 1*) have pointed out the marked fluctuation of daily totals. As observations in 1975 were rather shorter than those in 1976, variation in numbers between years could not be compared. In 1976 fluctuation of daily totals was most spectacular in the case of Kestrels and Honey Buzzards. The diversity of raptors observed in September 1975 was compared to that observed in September 1976 using a 2 x S homogeneity table (*Table 1*). The kestrels (*Falco naumanni/tinnunculus*) and harriers (*Circus macrourus/pygargus*) were treated as 'species' to reduce the effect of errors in indentification. The resident Peregrines were excluded. The samples differ significantly from one another (Chi squared = 54.17; $P < .0001$).

The variation in diversity of raptors observed between 21/9/76 and 29/9/76 was examined. Results were inconsistent with the above hypothesis (Chi squared = 125.3; $P < .0001$) and it may therefore be rejected.

The anomalously high variation reported above may have arisen in a number of ways; inadequacies of the sampling method, errors in counting and identification, variation in the pattern of migration from year to year, annual fluctuation of the relative abundance of a given species, random variation in the position of the migratory streams which need not coincide and association between the probability of a raptor sighted belonging to a given species and weather conditions.

While it would be idle to suppose that the probability of sighting a raptor is independent of the size of the bird, this is neither here nor there in relation to the calculations employed. Provided the method of observation is unchanged the samples are comparable. Since it is virtually impossible to maintain a high level of alertness while scanning with binoculars, unaided visual scanning was employed in all watches. Birds were then identified using 16 x 50 binoculars. The nature of the observations allows only one determination of diversity by a given observer and it is not possible to test the data for reproducibility. There is no evidence that the observational data are not reproducible. The reasons for small sample bias in diversity measurements have been discussed by Preston (*Ref.* 8). The observed variation is however much too great to be explicable in these terms.

Flocking behaviour doubtless contributes to the observed variation of diversity. Thus variation in the number of Black Kites and Marsh Harriers accounted for almost half of the observed inhomogeneity in the between-years test. However, even if these contributions are excluded, the value of Chi squared is still significant at the 1% level.

The problems of double counting and unjustified ommission probably only become important after 15.00 CET. The number of raptors loitering in the vicinity of Buskett thereafter gradually increased until sunset. Much care was taken to avoid making double counts and in the process some birds may have been incorrectly ommitted. The writer has taken the somewhat optimistic view that these errors tend to cancel out. There is in any case no way of being certain that a particular bird has not already been counted. The situation is in fact one of sampling with incomplete replacement and the proportion replaced should vary with sample size and diversity as well as with time of day.

In principle, errors in identification could account for the observed variation in diversity. However, most of the observed inhomogeneity was due to Black Kites, Marsh Harriers, Hobbys and Honey Buzzards, species which are fairly unmistakeable. Evidently the problem is more apparent than real.

The observed variation in diversity could in principle be explained as due to variation in the migration pattern, fluctuation in the relative abundance of a given species or annual variation in the position of migratory streams which need not coincide. While these explanations can account for the heterogeneity between years, they cannot account for that observed within a given year. Random variation in the position of migratory streams during a given year is intuitively unattractive and there is no evidence that it occurs among migrant raptors. Moreover, much of the observed heterogeneity was due to species which are believed to migrate on a relatively broad front.

It has been shown beyond reasonable doubt that the probability of a raptor sighted belonging to a given species is not constant both within and between years. While sampling inadequacies could account for some of the inhomogeneity, it seems unlikely that their effect is important. There appears to be some justification in seeking correlation between meteorological variables and the numbers of raptors sighted.

(II) On a Synoptic scale, anticyclonic conditions are the most favourable for migration by flapping flight. Clear skies, low wind strengths and the absence of strong down-draughts reduce the number of problems which a bird has to overcome. Moreover, the presence of an inversion within the troposphere hinders the passage of cold fronts which are usually deflected north-east. It would therefore be reasonable to suppose that Honey Buzzard sightings are positively correlated with atmospheric pressure. Analysis of observations made in 1975 had suggested that this was in fact the case ($.01 < P < .05$). (Ref. 9)

Table 1

2 x S CONTINGENCY TABLE

HOMOGENEITY TEST FOR SAMPLES OBTAINED IN SEPTEMBER 1975 and 1976

	1975 n1	1976 n2	$(n1/N1 - n2/N2)^2$ / n1 + n2
Osprey	3	3	3.267×10^{-6}
Honey Buzzard	217	707	1.042×10^{-5}
Black Kite	18	13	3.110×10^{-5}
Sparrowhawk	1	4	2.556×10^{-7}
Buzzard	3	3	3.267×10^{-6}
Booted Eagle	1	0	5.290×10^{-6}
Lesser Spotted Eagle	1	0	5.290×10^{-6}
Short-toed Eagle	2	4	2.686×10^{-7}
Hen Harrier	1	0	5.290×10^{-6}
Montagu's/Pallid Harrier	1	3	1.862×10^{-8}
Marsh Harrier	11	80	2.014×10^{-5}
Egyptian Vulture	1	0	5.290×10^{-6}
Hobby	113	211	2.153×10^{-5}
Eleonora's Falcon	6	22	8.119×10^{-7}
Lesser Kestrel/Kestrel	48	116	1.017×10^{-6}
Red Footed Falcon	0	1	7.355×10^{-7}
TOTALS	427	1167	
	N1	N2	

Chi squared $\doteq$ 54.17, degrees of freedom (df) = 15.
$P < .0001$.

Table 2

h x k CONTINGENCY TABLE

TEST OF SAMPLES OBTAINED FROM 21/9/76 to 29/9/76 FOR HOMOGENEITY

September	21	22	23	24	25	26	27	28	29	Species Totals
Honey buzzard	44	39	33	96	92	119	29	28	60	540
Marsh harrier	3	6	20	16	9	4	5	3	8	74
Hobby	33	28	11	38	17	14	8	6	13	168
Kestrels	4	3	12	15	8	7	11	8	14	82
DAILY TOTALS	84	76	76	165	126	144	53	45	95	864

Chi squared $\doteq$ 125.3, degrees of freedom (df) = 24
$P < .0001$.

Meteorological data were taken from the records of Meteorological Office Luqa and R.A.F. Qrendi. Data obtained from 30/8/76 to 10/10/76 (42 observations) were analysed.

As expected, Honey Buzzard numbers were significantly correlated with pressure at both Luqa and Qrendi. Correlation was highest with atmospheric pressure at Luqa at 19.00 CET ($r = .357$; $P < .01$) and lowest at 12.00 CET for Qrendi data ($r = .270$; $.01 < P < .05$). There are therefore good grounds for believing that Honey Buzzards cross the Sicilian Channel chiefly under anticyclonic conditions.

In principle, anticyclonic conditions may be detected in a variety of ways and Honey Buzzards may well use more than one method. Under anticyclonic conditions, wind-strengths are lower and vary less with height than under cyclonic conditions. The daily mean scalar wind strength between 0 and 1500 m (W) was calculated. Honey Buzzard numbers were significantly correlated with Qrendi data for W at 6.00 CET. ($r = -.497$; $P < .01$) (*Fig. 2*). Moreover, this correlation was better than that obtained for the individual wind-strengths and correlation with wind-strength at ground-level was no longer significant by 12.00 CET ($.05 < P$).

The above results may be interpreted as follows: Early in the day, Honey Buzzards 'decide' whether or not to cross the Sicilian Channel. Low wind-strengths within the first 1500 m are interpreted by the birds as favourable indications and favour a decision to cross the Channel.

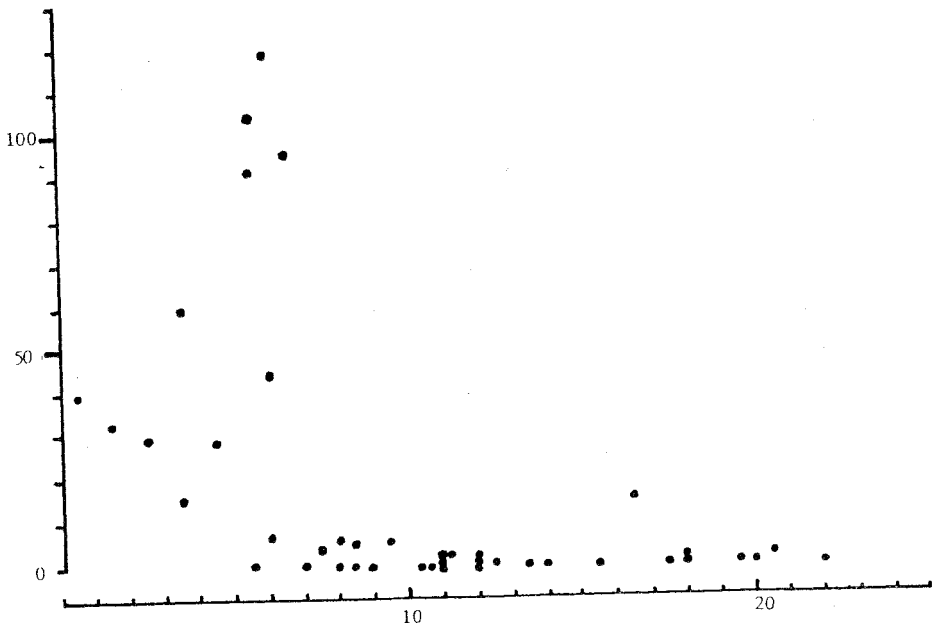


Fig. 2 Variation of Numbers of *P. apivorus* sighted with W. (mean wind strength below 1500 m at 6.00 CET in Knots: × 1.852 Km/hr). $r = -.497$; $P < .01$.

DISCUSSION

The Meteorology of the Central Mediterranean is dominated by the periodic fluctuations in intensity of the sub-tropical (Azores) anticyclone. In summer, a ridge of the latter extends towards the Alps and typically forms an anticyclonic cell over the Central Mediterranean The convective stability which results weakens those cold fronts which penetrate the Mediterranean. The calm settled weather which is characteristic of Mediterranean summers is a direct result of this. This state of affairs persists until early or mid-October when cyclogenesis, usually involving maritime polar and continental Tropical air-streams, intensifies. Troughs and depressions subsequently cross the Central Mediterranean in rapid succession.

A Honey Buzzard embarking on a crossing of the Central Mediterranean is unlikely to complete the 450 km. crossing from Southern Sicily to Libya in less than 12 hours. Birds crossing from points further north would take longer to complete the crossing, particularly if their heading has an appreciable easterly component. Moreover, the birds might fly at reduced speeds (closer to the minimum power speed) in order to lessen their power-output, in which case the crossing would take considerably longer. In opting to migrate under anticyclonic conditions, a Honey Buzzard is unconsciously making a short-term weather forecast. Anti-cyclonic cells are a more permanent feature of the weather conditions and are generally longer-lasting before mid-October than they are subsequently. The reliability of this forecast is consequently greater before mid-October than it is subsequently and Honey Buzzards making a relatively long sea-crossing would be better insured against unfavourable weather. By mid-October 99% of the Honey Buzzards and usually over 70% of all raptors observed in the Maltese Islands have been recorded.

The summer drought of the Mediterranean region is a relatively recent phenomenon. The sub-tropical convergence zone has gradually been extending northwards over the last few thousand years. Indeed 11,000 years ago, Mediterranean summers were probably similar to those experienced by western Europe today with conditions being much more variable and in general wetter. (*However see Ref. 10*). These changes are associated with fluctuations in the extent of the polar icecaps and there is good evidence that they are due to periodic changes in the Earth's orbit (*Ref. 4*). They are of course continuous and the present Maltese flora has been slow in some respects to adapt to these changes. There is a minor flowering peak in August which is out of phase with the onset of heavy rains in late September or early October (*Ref. 3, p. 83*).

When faced with such a situation, it would clearly be pointless to propose complicated behavioural adaptations for crossing the Mediterranean which depend on purely local weather conditions. Although these same conditions may appear fairly constant at present, their modification with time has been continuous and perhaps too rapid, from an evolutionary standpoint, for the appropriate adaptations to evolve.

However, although the mean position, intensity and frequency of occurrence of anticyclones and depressions may have varied appreciably, their intrinsic properties have remained unchanged. Anticyclonic conditions would always be more favourable for migration than cyclonic conditions. Any adaptations for making sea-crossings under anticyclonic conditions would not be limited in usefulness to the locally prevailing conditions alone.

This paper has dealt principally with the effects of Synoptic scale weather-conditions on the migration of *P. apivorus*. The ability of a bird to select the height, flight-style and speed at which it flies should radically alter its micro-environment. No attempt has here been made to elucidate the effect of smaller-scale meteorological phenomena.

Acknowledgements: I would like to thank M. Beaman for reading the manuscript, E. Curmi, N. Bonavia and C. Galea for supplementing my observations on a number of occasions and Messrs. Pace and Wright for allowing me to examine Meteorological records.

ABSTRACT

1. The appearance of a minority of the Honey Buzzards sighted at Buskett coincided with the approach of frontal systems. Data are presented which suggest that the birds are not using the thermals which precede these frontal systems to cross the Mediterranean. Rather, they appear to recognize the approach of an active frontal system as a potentially dangerous situation and make for the nearest land.

2. The samples of raptor-sightings made at Buskett were tested for homogeneity and differred significantly from one another ($P < .0001$) both within and between years. This is best interpreted as a distortion of the migration pattern by weather conditions.

3. On a Synoptic scale, anticyclonic conditions are the most favourable for migration by flapping flight. Indeed Honey Buzzard sightings were significantly correlated with atmospheric pressure ($P < .01$). Negative correlation with mean wind-strengths below 1500 m was better ($P < .01$). Low wind-strengths are typical of anticyclonic conditions and Honey Buzzards may use low wind-strengths as an indication of the prevalence of anticyclonic conditions. The autumn passage of Honey Buzzards occurs at a time of year when local conditions are mainly anticyclonic.

REFERENCES

1. Beaman M., Galea C. 1974, The visible migration of raptors over the Maltese islands *Ibis* 116: 419-431.
2. Gibb J., 1974, The Birds of the Maltese Islands *Ibis* 93: 109-127.
3. Haslam S.M., 1969, Malta's plant life. Progress Press Malta.
4. Hays J.D., Imbrie J., Shackleton N.J., 1976, Variations in the Earth's orbit: pacemaker of the ice ages. *Science* 194 (4270): 1121-1131.
5. Moreau R.E., 1953, Migration in the Mediterranean area *Ibis* 95: 329-364.
6. Moreau R.E., 1961, Problems of the Mediterranean – Saharan migration *Ibis* 103a: 373-427, 580-623.
7. Moreau R.E., 1972, The Palearctic-African bird migration systems. Academic Press London and New York.
8. Preston 1962, The canonical distribution of commonness and rarity. *Ecology* 43: 185-215, 410-432.
9. Thake M., 1976, Visible migration of raptors over Buskett – Autumn 1975. *Il-Merill* (17): 21-24.
10. Wright H.E. 1976, The environmental setting for plant domestication in the near east. *Science* 194 (4263): 385-389.

Erratum: IL-MERILL No. 17 page 24

Bottom line of Table 2 should read:

Hobby	**139-233**	**115**	**17.51%**	**48.7%**

NOTES

1. Purple Sandpiper *Calidris maritima*

A New Species To The List Of The Birds Of Malta

We were requested to examine a specimen, claimed to be a Purple Sandpiper *Calidris maritima*, by Mr. J. Pulis, a stuffed-bird collectionist. The specimen which was taken on 5th December 1976 from Gzira Pt. Limits of Wied il-Ghajn, turned out to be so, this being the first record for the Maltese Islands.

The Purple Sandpiper is known largely as a passage migrant and as a winter visitor in Europe. It is found right around the Arctic coast breeding in most of the countries which offer the tundra type of country which it prefers. In Europe it breeds mainly in the northern part of Scandinavia, while it winters south to the Atlantic coast of France; very occassionally as far south as Morocco. (*Information derived from Voous' Atlas of European Birds and from Vaurie's The Birds of the Palearctic Fauna*).

The specimen was very dark on the back, slightly darker on the crown. The back had an overall purplish kind of sheen. The breast was less dark with a sooty brown colour while the chin had a lighter colour. The belly was white. The inner part of the bill had a slightly orange hue while the legs were yellow ochre. The four outer tail feathers were very pale grey with a white edge while the four central tail feathers were dark and longer.

Mr. J. Pulis informed us that the bird appeared extremely tame, a characteristic behaviour of this species in winter quarters.

The measurements (in mm.) of the specimen were as follows: Wing – 122; Tail – 58; Tarsus – 21; and the Bill 29.

Joe Sultana & Charles Gauci

2. Unusual Nests of the Spectacled Warbler *Sylvia conspicillàta*

The Spectacled Warbler *Sylvia conspicillata* is one of the few resident species in the Maltese Islands, occurring mainly in open countryside. The nest is usually situated within a foot of the ground in low scrub (*Sultana & Gauci – The Breeding Birds of Malta – Malta Year Book 1970*). However 4 nests found during the last four years at Santa Lucia/Hal Saflieni area were much higher. One was found on 23rd May 1974 at Santa Lucia in a cypress tree at a height of about 137 cm above the ground. It contained 5 young which left the nest in June. The second nest was found in May 1975 in the same area but in a different cypress tree. This was only about 81 cm above the ground, but still relatively high for a Spectacled Warbler's nest. The third nest was found on 19th May 1976, again in the same area and in the same tree of the previous nest. It was built at a remarkable height of about 183 cm. The last nest was found at Hal Saflieni on 10th April 1977, at a height of about 163 cm in an introduced tree *Agave americana*.

Apart from the fact that the three nests found at Santa Lucia were all built in the same area (two in the same tree), it is interesting to note that they were all found in May. This suggests that adequate vegetation in which to build nests may not have been available in that area during that time and so the birds had to use trees as nesting sites.

Richard Cachia Zammit

3. White Wagtail Roost at Marsa Industrial Estate

Since its discovery at the Marsa Industrial Estate in the winter 74/75 (*Sultana, Gauci, Beaman – A Guide to the Birds of Malta – 1975*), the relatively new White Wagtail *Motacilla alba* roost was again present during the following two winters (75/76 & 76/77). The number of White Wagtails during the winter of 75/76 was estimated to be 400-500; however, no accurate count was carried out. The following winter an organised count on 8th December 1976 by D. Cachia, R. Cachia Zammit, P. Caruana and E. Cumi resulted in a total of about 1,650. Estimated counts on 21st November 1976 and on 22nd January 1977 were of 900-1000 and 1000 + respectively. Approximately 500 birds were still using the roost in late February. During the count on 8th December the wagtails were first noted coming in at 16.36, gathering first on the factory tops before entering the roost trees.

During the count of White Wagtails roost at the Great Siege Square, Valletta, which was carried out by J. Sultana and C. Gauci on 20th December 1973, the birds were first seen arriving at the roost at 16.40 (*J. Sultana pers. comm.*). Both the Valletta and Marsa counts were carried out during cloudless days. The count of the Valletta roost amounted to 2,500 + (*Sultana, Gauci, Beaman – A Guide to the Birds of Malta – 1975*). As no further counts at this roost were carried out in the following winters it is not known whether the increase in the number of wagtails using the Marsa roost coincided with any significant decrease in the number of birds using the Valletta roost.

Worthy of note is that the Marsa roost hosts other species. All through the year about 800-1,000 Spanish Sparrows use the same area while in winter a few Grey Wagtails and Starlings occassionally were noted using the roost.

Emmanuel Cumi

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