

OBSERVATIONS ON A MARKED POPULATION OF BLACKBIRDS AT LOWER HUTT.

By P. C. Bull, Lower Hutt.

INTRODUCTION.

A small-scale ringing study of blackbirds (*Turdus merula*) was started in Lower Hutt during July, 1951. From this work it is hoped to obtain information on length of life, movements, population composition and causes of mortality in these birds. A considerable amount of work of this kind has already been carried out overseas, but it is not yet known to what extent the results are applicable to the same species in New Zealand.

In Great Britain, Thomson (1949) records a recovery percentage of 5% on 64,187 blackbirds. From an analysis of recoveries, Lack (1943) found that 55% of first year blackbirds die during their first year, but that in older birds (second to fifth year of life) the annual mortality is fairly constant at about 40% in each age group. The oldest blackbird recovered had survived ten years which is only half the potential age of twenty years which has been reported for captive birds. Information on the movements of this species is given by Werth (1947) who showed that of the blackbirds ringed as nestlings in Great Britain and subsequently recovered, 93% were found within five miles of where they were ringed. Similarly, Venables and Venables (1952) found that the blackbird population of the Shetland Islands was surprisingly sedentary—several ringed birds being seen the year round within five miles of their birth place.

Although the present work has been in operation for less than two years, it was decided to publish this interim report in the belief that the experience so far gained will be of interest to other workers in this country where a national bird-ringing scheme has recently been organised (Cunningham, 1949). The results obtained show a general similarity to those already reported for blackbirds in Great Britain, but the number of birds handled is still inadequate to demonstrate any but the main features of behaviour.

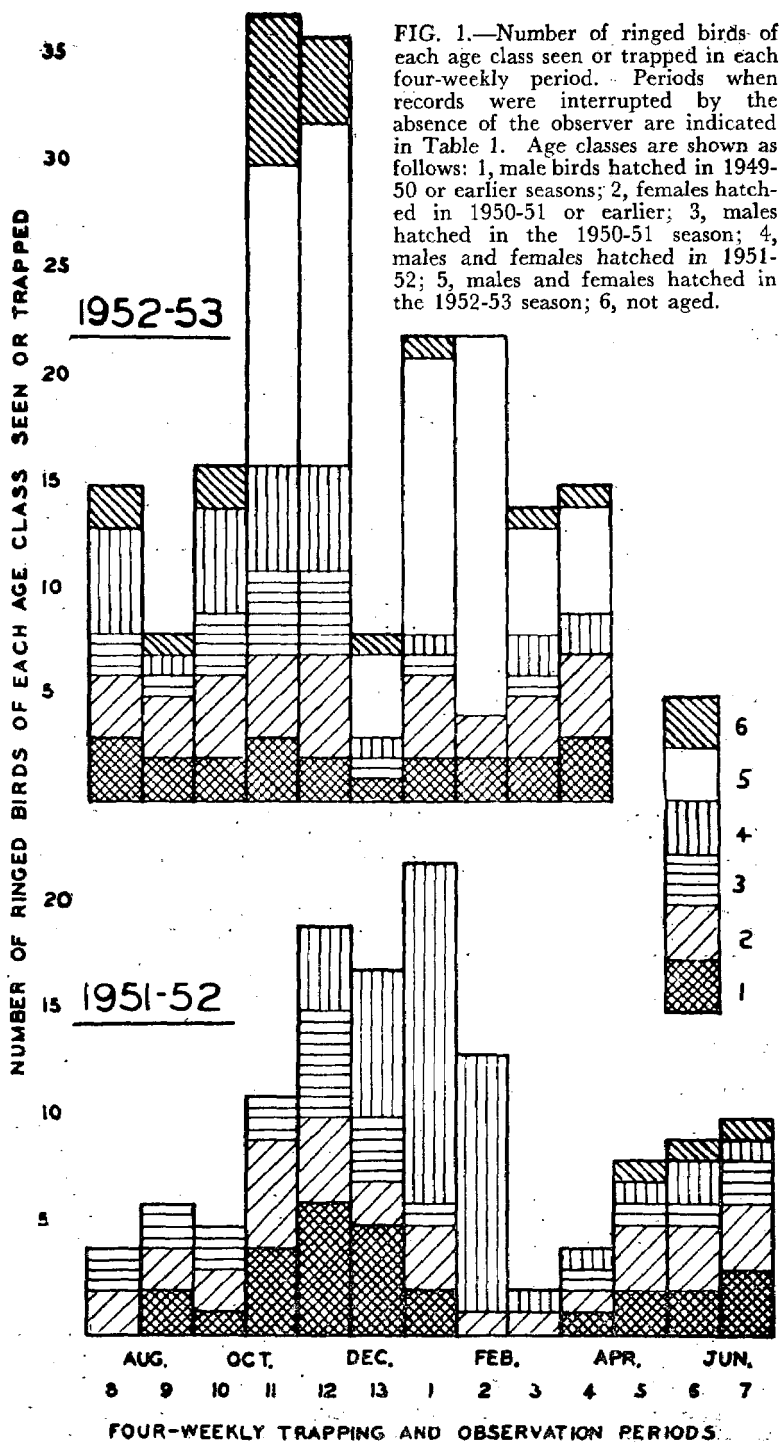
METHODS.

Blackbirds were trapped, marked with leg rings and then released at the place of capture. Subsequent records were obtained by re-trapping, by sight records of colour-ringed individuals and by the return of birds found dead.

The traps used were similar to the single cell Potter trap which is fully described by Hollom (1950). Briefly, it consists of a cage with a vertically sliding door which is held open by a prop attached to a treadle perch inside the cage. The weight of a bird entering the cage is sufficient to depress the perch, thus releasing the prop and allowing the door to shut. On a few occasions a hand-operated peg and cord release of the kind described by Cunningham (1946) was used, since this allows the operator to select the birds trapped and thus avoid unnecessary frightening of birds which are already ringed. A further disadvantage of the automatic mechanism is that the trap is frequently sprung by species which are not required. Flocks of white-eyes visited the traps in winter and made it almost impossible to use the automatic mechanism with traps set out in the open. House-sparrows, starlings, thrushes, hedge-sparrows, yellow-hammers and chaffinches were also trapped from time to time. If, however, the trap was set under the shade of low-growing bushes it was rare to catch species other than blackbirds, thrushes and hedge-sparrows. The automatic traps also have several advantages, more than one can be operated at the same time, they do not require continuous observation and they can be used in many places not suitable for the peg and cord technique.

Bread, fruit and fat were used as bait, and trapping was largely confined to the early mornings, weekends and holidays. At other times the traps were locked open and baited with an adequate supply of food.

Each time a bird was caught it was weighed and its plumage recorded by comparison with a set of study skins. During the second year an



attempt was made to record the extent of trapping effort, the unit being the "trap hour" (one trap set for one hour). Such a record has limitations because all trap hours are not of equal catching value. The causes of this are not fully understood, but temperature, time of day and the period elapsing since the trap was last left open appear to be important. Provided that these limitations are remembered, the trap hour record is of value as a rough indication of the intensity of trapping effort.

A single, numbered, aluminium ring stamped "Send Dom. Museum, N.Z.", was used on every bird, and, in addition, coloured rings were also employed for adults. The coloured rings were used in different combinations with the aluminium ring, so that each bird could be identified in the field without retrapping. Young birds were not colour ringed because the high mortality in this age group would be wasteful of both rings and combinations; any of these birds retrapped after the moult were then colour ringed as by that time the most severe mortality was over. Colour combinations were recognised in the field with the aid of a pair of 9x35 Ross binoculars, but even then it was difficult to be certain of them at distances greater than about twenty yards. Combinations involving a conspicuous colour over a darker colour, such as yellow over blue, were especially liable to error as it is easy to overlook the bottom ring unless the bird is standing on bare ground. It was also difficult to identify yellow and pink rings correctly as these colours appear much alike under certain lighting conditions.

Trapping was started at the author's home in Waterloo Road, Lower Hutt (station A) on 16 July, 1951. Two traps were used during most of the first year, but this number was later gradually increased to five. Intermittent trapping was also undertaken at five sub-stations located within three miles of the main station. These sub-stations were set up in the hope of recording the frequency of movements between stations. The trapping stations are situated in an extensive residential area in the Hutt Valley. Birds can move several miles north or south from the trapping stations and still remain in the densely settled floor of the valley, where they are liable to be caught by domestic cats. Birds moving east or west, however, soon reach the steep, scrub-covered hills where their movements cannot be followed. Station A includes an area of about half an acre of lawns, shrubs and fruit trees and adjacent properties are also fairly spacious and well planted. Good views of two lawns could be obtained from the windows of the house, and records from beyond the station were sometimes obtained by driving slowly along the roads in a car in the early morning. Observation effort was recorded each day on the basis of the number of hours the observer was in a position from which he could reasonably expect to see any birds appearing on one or other of the lawns. A daily record was kept of trap hours, observation hours and the ring numbers of birds seen or trapped.

RESULTS.

During the period 16 July, 1951, to 25 March, 1953, a total of 139 blackbirds was ringed at station A. This figure is made up of 28 males (16 of them first-winter birds), 19 females, 86 birds in juvenile plumage and 6 nestlings. A further 50 birds were ringed at the various sub-stations giving a grand total of 189 blackbirds. The following account is confined to the results obtained at station A except where otherwise stated.

Some information on the age structure of the population is given in Fig. 1, but these data will become more complete as the study progresses. When the work began, males reared during the previous season could be readily distinguished from older males by their plumage, but this was not so with females. Three groups were thus recognized, viz., (1) male birds hatched in 1949-50 or earlier seasons; (2) females hatched in 1950-51 or earlier; and (3) males hatched in the 1950-51 season. Two other groups (4 and 5) were identified by ringing during the subsequent two breeding seasons and these included both males and females. Group 6 (not aged) consisted mostly of un-ringed females trapped during the second year of

work and which could not then be assigned to any one of the other five classes.

The number of birds trapped in each four-weekly period is set out in Table 1 which shows a marked seasonal variation in trapping success.

TABLE 1.—Number of Blackbirds Trapped or Seen in each Four-Weekly Period.

Period No.	Dates	No. of New Birds Trapped.	No. of Birds Retrapped ¹	Total No. of Birds Trapped.	Trap Hours	Total No. of Birds Seen. ²	Observation Hours
8	Jul. 16–Aug. 12, 1951	4	1	5	—	4	—
9	Aug. 13–Sep. 9, 1951	3	0	3	—	6	—
10	Sep. 10–Oct. 7, 1951	0	0	0	—	5	—
11*	Oct. 8–Nov. 4, 1951	7	0	7	—	8	—
12	Nov. 5–Dec. 2, 1951	9	7	16	—	12	—
13	Dec. 3–Dec. 31, 1951	11	3	14	—	5	—
1	Jan. 1–Jan. 28, 1952	16	5	21	—	5	—
2	Jan. 29–Feb. 25, 1952	6	9	15	387	0	16
3	Feb. 26–Mar. 25, 1952	2	0	2	199	0	17
4*	Mar. 26–Apr. 22, 1952	1	0	1	86	3	6
5	Apr. 23–May 20, 1952	1	1	2	356	7	7
6	May 21–Jun. 17, 1952	1	1	2	490	7	10
7	Jun. 18–Jul. 15, 1952	0	0	0	94	10	30
8	Jul. 16–Aug. 12, 1952	3	1	4	143	13	28
9	Aug. 13–Sep. 9, 1952	1	1	2	78	7	18
10	Sep. 10–Oct. 7, 1952	4	3	7	272	11	30
11	Oct. 8–Nov. 4, 1952	19	23	42	456	14	36
12	Nov. 5–Dec. 2, 1952	16	19	35	359	13	20
13*	Dec. 3–Dec. 31, 1952	4	2	6	189	2	6
1*	Jan. 1–Jan. 28, 1953	12	4	16	167	8	8
2	Jan. 29–Feb. 25, 1953	13	9	22	270	4	102
3	Feb. 26–Mar. 25, 1953	0	9	9	497	10	79

Note.—* Indicates observations confined to one half of the period.

1 The same bird trapped more than once in the period is counted on each occasion.

2 Excludes birds trapped but not otherwise seen.

In both seasons the birds were trapped more freely during the 20 weeks 8 October to 25 February, and, over the two seasons, 84% of the total trappings occurred during this period which represents only 45% of the entire trapping period. Variations in trapping effort do not account for this fact since in the second year, when trap hours were recorded, 82% of the trappings were achieved during only 42% of the total trap hours. From October to February the ratio of trap hours to birds caught was 12:1, whereas during the rest of the year it was approximately 75:1. The table also shows that more birds were trapped during the second year than the first, but this is largely because more traps were used in 1952-53. During the eight weeks 29 January to 25 March, the only period for which trap hour data are available for both years, the ratio of trap hours to birds caught was 34:1 in 1951-52 and 24:1 in 1952-53, and little significance can be attached to this difference since the trap hour record has considerable limitations. Similarly, the earlier trapping of the first juveniles in the 1952-53 season is largely, but not entirely, accounted for by the fact that no trapping was done during the period 1-20 October, 1951. Fig. 1 shows the seasonal variations in the age composition of the population on the basis of the birds trapped or seen about the station during each four-weekly period, and it is apparent that the period of improved trapping success (October to February) coincides with a time when the population contains a high proportion of juveniles, and this section of the population does in fact account for much of the successful spring and summer trapping, but not all of it. By omitting the juveniles it was found that 70% of the remaining trappings occurred during the October-February period—a time when the birds were breeding. When the traps were left locked open it was not uncommon to see birds removing beakfull of bait and flying off to their young with it, and it appears that birds are less trap shy at this time. Finally, there is evidence (detailed below) that blackbirds have a wider foraging range when feeding young so that more

individuals visit the trapping station than at other seasons. The increased trapping success during the October-February period is due then, firstly to the large numbers of inexperienced juvenile birds, secondly to the less cautious behaviour of adults feeding young, and thirdly to an increased foraging range of adults at this time.

Some indication of the movements of adult blackbirds can be obtained from the subsequent history of the 26 adults ringed prior to 18 January, 1952. Of these, 6 (3 males and 3 females) were seen several times each month except during the period January to March, when they were moulting and appeared to remain in cover. The total sight records (number of days on which they were recorded) for the three males numbered 70, 72 and 91 respectively, and for the three females 40, 48 and 50. Nine birds were never seen again at the station after ringing, but one of these was caught by a cat less than 100 yards from the station six months later. Five other birds were absent for nearly a year after ringing and then appeared occasionally over a few weeks carrying off beaksfull of food; they then disappeared again. The remaining six birds were seen for a few weeks after ringing and were then lost or else appeared briefly at irregular intervals. One of these birds was subsequently seen about 100 yards from the trapping station. Four behaviour groups can thus be recognized, viz., the residents, the spring visitors, the birds of irregular appearance and finally those which were not seen again after ringing. The facts available fit the hypothesis that the adult population is rather sedentary and that frequency of occurrence at the trapping station is the effect of proximity of home range, and that this latter increases in size when the birds are feeding young.

Observations on the movements of young birds were confined to the results of retrapping and the occasional return of dead birds, because coloured rings were not added until after the moult. Juveniles were frequently retrapped several times within a week or two of ringing and occasionally over a longer period; two birds were each retrapped twice with periods of absence of about four weeks between recoveries. Of the 30 juveniles ringed during the summer of the 1951-52 season only five reappeared at the trapping station during the period May to December, 1952. Two of these reappeared in May and June respectively and became resident in the garden (at least one of them bred successfully), but the other three were not seen until the spring although they may have been present in a neighbouring garden. Three other birds ringed as juveniles were recovered dead during the months February, April and October at distances of up to one mile from the trapping station. A young bird ringed at sub-station B (about a mile distant from station A) on 24 October, 1952, was retrapped at station A three days later. This was the only instance of a bird being retrapped at a station other than the one at which it was ringed. Small numbers of unringed birds of the year continued to enter the traps all through the winter and spring. The juvenile population thus seems to be rather less sedentary than the adult one but the movements occur within a relatively restricted radius of the trapping station. Further evidence of the sedentary nature of the blackbird population (or of its high density) is provided by the fact that a person only half a mile from station A shot 30 blackbirds in his garden during December, 1952, and January, 1953, and not one of them was ringed. (The birds were shot because they were destroying fruit.)

During the spring and early summer, juveniles form a high proportion of the blackbird population (Fig. 1), but in subsequent months the proportion of birds of the year drops to a level comparable to that of the other age classes. It is evident, therefore, that many of the young die or move away from the station. There is no reason to suppose that the number of birds leaving the station exceeds that of birds entering it from outside. The declining proportion of young birds must, therefore, indicate a substantial mortality. In considering Fig. 1 it has to be remembered that the data are influenced by their manner of collection. For instance, the number of young birds recorded is a measure of trapping success, since,

lacking coloured rings, the young birds cannot be recognised in the field. The number of adults recorded during the early part of the year also declines, not necessarily because there are fewer birds, but because they enter the traps less readily and remain under the cover of bushes where they cannot be seen. A fair comparison is between the latter part of two successive years which is a time when the birds trap readily and a high proportion of young of the previous year is colour ringed. Such a comparison shows that by the spring of 1952, the number of birds of the 1951-52 age class is little more than one-third what it was in the previous summer, and this suggests a mortality of the order of 60%. This figure must be considered as little more than a rough indication of the extent of mortality, and much larger figures would be needed before it could be regarded with any degree of confidence.

Of the 26 adult blackbirds ringed during the 1951-52 breeding season, 14 were known to be still alive during the following season, suggesting a survival rate somewhat greater than 50%. Of the remaining 12 birds, only one is known to be dead and it is likely that some at least of the remainder are still alive. Indeed, colour-ringed blackbirds have been reported at two localities, respectively one and two miles distant from station A, but their identity is uncertain because the observers did not note the colour combinations. The 26 birds included a few which were not yet a year old and thus probably subject to greater dispersal and mortality than older birds. The percentage of final (dead) recoveries on birds ringed up to 31 March, 1953, is 7% for birds ringed in juvenile plumage and 2% for older birds (one recovery).

The term "home range" rather than "territory" has been used in the foregoing account because the latter term suggests a degree of aggression not observed during the present study, but each bird nevertheless lives in a fairly restricted area. During a period of 20 months, 133 blackbirds (86 of them juveniles) visited the half-acre of garden comprising station A, yet comparatively little antagonism was observed. The only display definitely identified as territorial was observed when a male, gathering food for its young, approached within ten feet of a tree in which a second male had a nest of young. The owner of the nest then postured aggressively and the other male withdrew a few feet and then both returned to the task of hunting for worms without taking further interest in each other. On other occasions brief encounters were observed between birds of either sex or any age, but these seemed to result from one bird approaching another too closely and were not obviously related to any territorial defence. On the morning of 3 August, 1952, five males (two first-winter birds and three adults) indulged in a communal display which closely followed that described by Lack (1941).

Data collected on changes of weight, plumage variations and moult are not included here since the number of birds handled is still relatively small. Two isolated observations on birds with white feathers are, however, of some interest in view of the fact that such characteristics are sometimes cited as a means of permanent identification of the individuals showing them. The first concerns an adult male first ringed on 15 August, 1951, and retrapped on five occasions between then and 28 October, 1952, its plumage being jet black. During March, 1953, the bird was seen several times after the moult and showed a conspicuous white feather on the left wing butt. The exact identity of the feather will remain in doubt until the bird is retrapped, but there is no doubt about the fact that there was no white feather on the wing during the two previous seasons. The last time the bird was caught it had a deep flesh wound on the upper part of the right leg and a large piece of skin was hanging down loose and dry with the feathers still attached. It is possible that the white feather is the result of an injury to the wing at the same time. A second bird, a female, had a white feather on the breast when first trapped in November, 1951, but there was no sign of it when the bird was retrapped nearly a year later. It thus seems that in some instances white feathers do not persist from year to year.

DISCUSSION.

The kind of information emerging from the present study has been indicated in the previous section, and, allowing for the relatively small number of birds handled, the results conform to those already reported for blackbirds in Great Britain. This appears to be so with regard to the figures for survival and mortality (Lack 1943), the limited extent of movements (Werth, 1947; Venables and Venables, 1952) and communal display (Lack, 1941). The lack of strict territorial defence is in agreement with the findings of Colquhoun (1940) and contrary to those of Lack and Light (1941). These last authors trapped 38 blackbirds of which about 66% were males, and suggest that males enter the traps more freely than females. Of 47 adults trapped during the present work, 60% were males, but ringed females were retrapped just as frequently as were ringed males and this suggests that the sexes do not differ in their readiness to enter traps. Possibly the males have a rather wider feeding range so that more males than females would be trapped at a given point. Certainly males are seen more frequently than are females; three ringed males resident in the garden during most of the study period were seen on an average of 78 days, whereas the comparable figure for three females was only 46 days.

Relatively few adults were trapped after the end of the breeding season and during the period of moult many individuals were rarely seen at all. This is in agreement with the finding of Colquhoun (1940), who noted a late summer decline in the number of blackbirds seen in an area of English woodland and thought it was the result of a decline in conspicuous behaviour following the termination of the breeding season. Since few birds are seen or trapped during the late summer, there is a break in the records of most individuals at this time, and this break can be used to separate one year's records from those of another.

Lack's (1943) work was based on recoveries of birds ringed as nestlings but in the present instance the birds were ringed some time after they had left the nest. This means that, although the approximate age of the bird could often be determined by its plumage, the exact birthplace was rarely known. It is not possible to ring a sufficiently large number of nestlings in an area consisting of numerous small, privately-owned gardens. On the other hand, a substantial human population, together with its attendant cats, is necessary if recoveries are required from places other than the ringing station. The percentage of recovery of ringed blackbirds in Great Britain is only 5% (Thomson, 1949) despite the dense human population and the existence of bird observatories along migration routes.

It was originally hoped to trace the movements of colour ringed individuals by using the reports of people who saw them in their gardens, but it soon became evident that the correct observation and recording of colour combinations is a task for which special experience is required. The number of incorrect combinations reported was so great that none of the reports could be accepted. Better results might be expected if a ringing study were undertaken in a fruit-growing district where there would be a chance of finding ringed birds among those destroyed in orchards, and coloured rings would not then be required. Since it is probable that trapping success is to some extent a measure of food shortage, it would be interesting to determine whether or not the variations in other districts coincide with those found at Lower Hutt. Continuation of the present work will provide further information on movements, length of life and the extent of mortality, but a comprehensive answer can only be obtained from a study involving the ringing and recovery of much larger numbers of birds than is possible in the present instance.

ACKNOWLEDGMENTS.

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Taylor, Mrs. Tully, Miss G. Walker and Major G. F. Yerex. Finally, Dr. R. A. Falla, Dr. K. Wodzicki and Mr. J. S. Watson have made helpful suggestions concerning the preparation of the results for publication, and I am also grateful to Mr. J. M. Cunningham, former convener of the Ringing Committee, Ornithological Society of New Zealand, for assistance in procuring a supply of rings.

SUMMARY.

Methods and preliminary results are given of a study involving the ringing of 189 blackbirds (*Turdus merula*) at Lower Hutt, New Zealand, between 16 July, 1951 and 25 March, 1953. Results generally follow those already reported from blackbirds in Great Britain. Adult birds were resident about the trapping station, but defence of territory was not marked; the size of the home range increased when the birds were feeding young. Of 26 ringed adults, 14 were retrapped at the station a year later, but only one of the rest was known to be dead; mortality among birds of the year was much higher. Young birds were recovered from up to a mile from where ringed. There was a marked seasonal variation in trapping success of both adults and juveniles, 84% of the birds were caught between October and February.

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NEW MEMBERS.

* Life member.

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|--|---|
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| Litchfield, H. Y., Waerenga-o-Kuri, Gisborne. | Henderson, L. E., Marama Av., Otatara. |
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THE 11th INTERNATIONAL ORNITHOLOGICAL CONGRESS, presided over by Sir Landsborough Thomson, London, will be held in Basel (Switzerland) from 29 May to 5 June, 1954. During the week of the congress, five days will be devoted to meetings and two to excursions. Before and after the congress (25-28 May and 7-19 June) excursions will be arranged to enable members to become acquainted with the Swiss avifauna, especially of the Alps and Lower Alps. The congress fee is 30 Swiss francs. The prospectus, containing registration form and detailed information, will be distributed this summer. Applications to attend, and to contribute scientific papers, should be sent in before 28 February, 1954, and addressed to: XI. International Ornithological Congress, Zoological Garden, Basel, Switzerland, which is at disposal for any inquiries needed.