The Quaker Story

Edgar Allan Poe

F. Morris

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THE AUTHOR TO THE READER

THE phenomenal success of my film of "The Cuckoo's Secret" encourages me to make an appeal to readers of this book for assistance in prosecuting my investigations into the habits of the Cuckoo. Having established the methods she employs in victimising Meadow Pipits, I wish to proceed to study her relations with the Reed Warbler, which is probably the only other British foster-bird of the Cuckoo whose nesting-habits can be so controlled as to render observation and photographic record possible.

The difficulty is to find a suitable site for operations. What is required is a reed-bed, where not less than six nor more than a dozen pairs of Reed Warblers are accustomed to nest, and which is known to be frequented by a Cuckoo. It must be isolated from any other suitable breeding-ground for Reed Warblers by a distance of not less than a mile—preferably two or three miles—and should be within fairly easy access of London.

May I ask any reader of this book, who can give me any information of such a site, to communicate with me, giving full particulars?

EDGAR CHANCE,

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LONDON, W. 1

The Cuckoo's Secret

“Some say that when the young Cuckoo grows it ejects the other young birds, which then perish. Others say that the foster-mother kills them and feeds the young Cuckoo with them, for the beauty of the young Cuckoo makes her despise her own offspring. *People say that they have been eye-witnesses of these things.*”

—ARISTOTLE (c. 350 B.C.),
Historia Animalium, ix. 29.

CUCKOO ("MARY PICKFORD") TAKING MEADOW PIPIT'S EGG FROM DUMMY NEST.

(Photo by Miss E. L. Turner.)

[Frontispiece

The Cuckoo's Secret

by Edgar Chance, M.B.O.U.

London: Sidgwick & Jackson, Ltd.

3 Adam Street, W.C.2

1922

QL 656.C5C5

PREFACE

THE claim made by the title of this book* is based upon the fact that never before in the history of ornithology has any observer been able to foretell the time, place, and circumstances of the laying of a Cuckoo's egg, and thus designedly to witness the act itself. It will be evident to readers of this book that, without the necessary preparation which foreknowledge alone can make possible, all purely casual observations of the deposition of Cuckoos' eggs must lack the precision of detail which is essential to accurate knowledge, and which my system has secured.

The value of photography in corroborating the record of eye-witnesses is obvious to all. Whereas the instantaneous "snap" shows but a single instant of arrested movement, cinematography enables the naturalist of to-day to secure a continuous record of a bird's incessant activities. Yet

* I am indebted to Sir William Beach Thomas for originating this title in an article by him in the *Daily Mail* early in 1921.

while photography thus acts as handmaid to history, even the ideal "film" of bird-life needs explanation; and this book is thus complementary to my Cuckoo film. Moreover, the naturalist cannot be content merely to record observations, but instinctively seeks reasons and motives. I have no wish to belittle the pleasing pastime of evolving theories in the effort to elucidate the many problems with which the study of the Cuckoo is beset, and this perhaps the more especially since my critics will doubtless perceive that I am myself addicted to that fascinating pursuit. Nor do I wish in any way to pose as a dogmatic authority. But I do claim that Fortune has favoured me with opportunities for making observations which go further than any yet presented, and it is largely in the hope that they will stimulate others to work along similar lines that I have been encouraged to reproduce my experiences in their present form.

It is my aim to confine myself as far as possible to facts which have come under my own notice, and in the main to support my deductions with the evidence derived from them. In other words, it is my object to give a detailed account of my actual experiences rather than produce a volume based, for the most part, upon theory and information

culled from the writings of others. These experiences are recorded step by step so that it can be seen and understood how they led up to such a comprehensive knowledge of the habits of a Cuckoo that I was at length, on several occasions, enabled to be instrumental in the successful filming of her in the act of laying her egg.

This film was exhibited to the members of the Zoological Society, Regent's Park, London, on Tuesday, November 8, 1921, and, by the courtesy of that Society, on the following evening to the British Ornithologists' Union. The following Wednesday (November 16) at the New Gallery Kinema, Regent Street, selections from the film, profusely interspersed with explanatory titles, were exhibited to members of the Film Trade, Press, and general public—an enthusiastic audience numbering nearly 700 people. At the conclusion, speeches were made by Viscount Grey of Fallodon and Sir Robert Baden-Powell endorsing the scientific and educational value of the film. The exhibition rights have now been leased, with an option of purchase, to British Instructional Films, Ltd., of The Studio, Boreham Wood, Elstree, Herts, whose intention it is to exploit it, under the title of "The Cuckoo's Secret," in association with five other Natural

History films prepared under the auspices of the Selborne Society. I have retained the right personally to lecture with the film.

My readers will realise, as they study this book, the great debt of gratitude which I owe, and have the pleasure of acknowledging here, to many friends who gave me valuable assistance in the course of our four years' campaign. Their names are recorded in the daily record of our observations. I am under a more specific obligation to Mr. E. E. Pettitt for his considerable help in the preparation of the manuscript of this book, and to my publishers, who have more than lightened the labour of seeing it through the press.

The scientific names of the birds mentioned, which I have given for the benefit of foreign readers, are in accordance with the nomenclature adopted by Howard Saunders in his *Manual of British Birds*, second edition, 1899.

EDGAR CHANCE.

9, HAY HILL, BERKELEY SQUARE,
LONDON, W.1.

February, 1922.

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LIST OF SCIENTIFIC NAMES

From Howard Saunders' *Manual of British Birds*
Second Edition, 1899

- CUCKOO. *Cuculus canorus*. L.
Meadow Pipit. *Anthus pratensis*. L.
Tree Pipit. *Anthus trivialis*. L.
Reed Warbler. *Acrocephalus streperus*.
Sedge Warbler. *Acrocephalus phragmitis*.
Hedge-sparrow. *Accentor modularis*. L.
Robin. *Erithacus rubecula*. L.
Pied Wagtail. *Motacilla lugubris*. L.
Yellow Wagtail. *Motacilla raii*.
Grey Wagtail. *Motacilla melanope*.
Whitethroat. *Sylvia cinerea*.
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Yellow Bunting. *Emberiza citrinella*. L.
Reed Bunting. *Emberiza schoeniclus*. L.
Spotted Flycatcher. *Muscicapa grisola*. L.
Skylark. *Alauda arvensis*. L.
Greenfinch. *Ligurinus chloris*. L.
Chaffinch. *Fringilla coelebs*. L.

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- Chiffchaff. *Phylloscopus rufus*.
Willow Wren. *Phylloscopus trochilus*. L.
Linnet. *Linota cannabina*. L.
Nightingale. *Daulias lusciniæ*. L.
Song Thrush. *Turdus musicus*. L.
Blackbird. *Turdus merula*. L.
Lesser Redpoll. *Linota rufescens*.
Red-backed Shrike. *Lanius collurio*. L.
Kestrel. *Falco tinnunculus*. L.
Great Tit. *Parus major*. L.
Jay. *Garrulus glandarius*. L.
Grasshopper Warbler. *Locustella naevia*.
Marsh Warbler. *Acrocephalus palustris*.
Dabchick (Little Grebe). *Podiceps fluviatilis*.

THE CUCKOO'S SECRET

CHAPTER I

INTRODUCTORY

PROBABLY no bird has taken a more conspicuous place in the interests of mankind than the common Cuckoo (*Cuculus canorus*, L.). The very name of the bird, "echoic" in origin as it is, and existing in phonetic parallels in the ancient and modern languages of Europe, is evidence of its long-standing familiarity to Western civilisation. Allusions to the Cuckoo abound both in folk-lore * and literature ; in its character as " the harbinger of spring "

* A famous example of Cuckoo superstition is the belief that the Cuckoo changes into a hawk and back again. This myth was known to the ancients, but Aristotle, writing 300 B.C., dismissed it as incredible. Nevertheless it persisted through the ages, no doubt on account of the resemblance between a Cuckoo and such a bird as our Sparrowhawk (*Accipiter nisus*, L.). A gamekeeper of Durham excused himself for shooting a Cuckoo by saying that " it was well-known that Sparrowhawks turned into Cuckoos in the summer " : see Burne and Jackson's *Shropshire Folklore* (1883), p. 222.

it forms the subject of several of the most famous poems in the English language. Moreover, its well-known " parasitic " habits have stimulated the curiosity of bird lovers to such an extent that there is extant a large mass of Cuckoo literature, in which theories, often of the wildest and most fantastic kind, have to a great extent taken precedence over ascertained facts. At the same time it would appear that many practical ornithologists who have acquired personal knowledge of the subject, have refrained from recording their experiences, and that many collectors, with numbers of Cuckoos' eggs reposing in their cabinets, have remained unaware how much of the bird's life-story is written upon the empty shells.

For the information of such of my readers as may feel themselves insufficiently versed in elementary Cuckoo-knowledge, I begin by stating briefly some of the main facts.

The Cuckoo is a summer visitor to our islands, where it is well distributed and met with amidst all the varied scenery which this country can show. It returns to us from its African winter-quarters during April and May, April 20 being a fair average date on which we (in the south) may reasonably expect first to hear its welcome call. Presumably

the males precede the females. To the unpractised eye the sexes are indistinguishable in appearance. The male is most easily identified by his note of "cuck-oo," the female by an equally unmistakable, though not nearly so well-known, "bubbling" call of a single syllable repeated several times quickly and sharply. In at least many instances both males and females return to the haunts occupied in previous seasons. The authorities state that the bird is polyandrous, but I think we have insufficient evidence as yet on which to lay down the law.* The eggs are always deposited singly in the nests of other species, such as pipits, warblers, wagtails, etc., the fosterer hatching the egg and rearing the young. Each hen Cuckoo is probably parasitic, so far as she can be, upon a particular species, her dupes being most likely selected from amongst that species by which she herself was reared. The number of eggs laid in a season by a Cuckoo in normal circumstances is not, one might almost say cannot be, ascertained; on the average it may be anything from six to a dozen. When hatched, the young Cuckoo almost immediately sets to work to evict the hatched or unhatched contents of the nest in which it finds itself.

* See Chapter XVII., p. 235.

Thus it secures the undivided attentions of its fosterers, who continue to feed it for some time after it leaves the nest at about the age of three weeks. Adult Cuckoos cease to call and set about their southward migration when the females have finished laying their eggs ; that is, at the end of June and early in July. The young Cuckoos follow at a later date, thus providing one of the mysteries of migration, for their elders do not remain to lead the way.

The above outline is introduced merely with the idea of forming a groundwork for the easier appreciation of the facts I am about to present, and also to show that even in such a meagre summary it is necessary at present to qualify statement after statement.

Reference to the standard works on birds will show that hitherto knowledge of the Cuckoo has been in a state of flux. The proved facts about the bird have not bulked very largely, and we frequently find that complete theories are built upon some more or less isolated observation which may either have been wrongly interpreted or have been but the idiosyncrasy of some individual Cuckoo. With the invaluable assistance of my friends, we have together got so far to the heart of

the problem as to have been able, as it were, so to engineer circumstances that the Cuckoo has, over and over again, revealed her secret for our edification and instruction. Herein lies the uniqueness of our methods, for it is scarcely an exaggeration to say that we have made our Cuckoos show us what we want to see, whereas all previous students have had to rely solely upon luck, which, where the Cuckoo is concerned, is well-nigh useless.

Amongst those previous students to whom I just have referred, the place of honour is taken by Dr. Eugene Rey, of Leipzig, who in 1892 published a record * of his investigations and researches in Cuckoo problems extending over a number of years. The results which he achieved appear, nevertheless, to be almost unknown to most of our field-naturalists, as indeed I must confess they were to myself until after I had made many of the observations recorded in this volume. So interesting is his book that I have recently had it translated into English, and have been thus able to introduce it to many practical ornithologists.

* Altes und Neues aus dem Haushalte des Kuckucks. (*Zoologische Vortraege*, herausgegeben von W. Marshall, Heft 11.) Leipzig, 1892.

In view of the claim I have put forward above, it is interesting to note that in the course of his book Rey remarks—

“As is only natural, the removal of eggs from nests by Cuckoos has only very rarely been directly observed, as it is only by accident that so shy and cautious a bird as the Cuckoo allows itself to be spied upon in its doings.”

“Only by accident”—in 1892; but now, within thirty years of Rey's statement, we have acquired such a control over the actions of a Cuckoo, that, on many occasions, after prophesying the day and hour when she would lay, and the very nest in which she would deposit her egg, we have seen the forecast accurately fulfilled.

Another quotation from Rey, this time from his preface, is also appropriate—

“My object was not so much to collect a large number of eggs as to make special investigation with regard to a few points in connection with the domestic economy of the Cuckoo which still required illustration; and I was of opinion that I could attain my object better by making a thorough examination of a small territory than by means of a superficial investigation of more extensive areas.”

The results of our own investigation will doubtless be regarded as proof of the soundness of Rey's reasoning. Clearly the only possible way of discovering definitely, as we claim to have done—

- (1) The normal interval a Cuckoo requires between the laying of her eggs ;
- (2) The number of eggs which an individual Cuckoo can, under favourable circumstances, lay in a season ; and
- (3) The incidents preceding and during the process of the laying of an egg by a Cuckoo—

is to find *the whole* of the possible fosterers' nests *throughout the laying season* in *the whole* of a particular Cuckoo's laying area, and to create in that area throughout the season a continuous supply of nests of the species of fosterer most favoured by the particular Cuckoo under observation.

Valuable as Dr. Rey's careful investigations undoubtedly are, I am unable to share many of his conclusions. The majority of his observations would appear to have been confined to Cuckoos whose dupes were Red-backed Shrikes (*Lanius collurio*, L.) ; and I would commend to the notice of naturalists, for their emulation, Dr. Rey's sane attitude in refusing to generalise about all types

of Cuckoo on the strength of the facts gathered by him regarding the habits of the Shrike-Cuckoo. It is outside the scope of this book to discuss all Rey's theories; but I must quote one more passage from his work, before leaving it with a strong recommendation to all ornithologists to make its better acquaintance.

In an interesting chapter on the uniformity of the eggs laid by one and the same Cuckoo, Rey gives the answer to the question so often put to me as to how and why I know that it is one and the same Cuckoo that I studied throughout four seasons. Rey's words are these—

“As there is an immense difference between the eggs of different female birds in the case of the Cuckoo, the correspondence between the eggs of each individual bird furnishes us with an excellent means of studying the life habits of the individual, because its eggs serve us as proof of identity. And such an aid to identification is especially valuable in the case of the Cuckoo, which shows local and individual differences in its habits very much greater than those observed in the case of any other bird.”

In fact, any one who challenges the ability of an oologist to identify individual Cuckoos by their

eggs would merely expose a lack of personal experience in this direction.

Of course, in the case of our own study in 1920, the fact that after the laying of the tenth egg we had reached the stage when we were able to take friends out to see the Cuckoo lay her eggs at approximately appointed times on a given territory, conclusively proved that we were in fact correct in our assumption that the Cuckoo we were studying was one and the same bird. And this conclusion is most strikingly borne out by the wholly successful manner in which, in 1921, we were able, when so desired, to place the cinematographer just where he could film the Cuckoo laying.

An earlier acquaintance with Rey's monograph might have sooner turned my attention to the Cuckoo problem. For many a season, like most field-naturalists, I duly made an entry in my notebook of the day when the Cuckoo returned. Later in the year, the finding of an occasional egg in one or other of the nests of the small birds usually selected by the Cuckoo for fosterers was an event, interesting but virtually meaningless, for I had not grasped the truth that the way to an intimate knowledge of the Cuckoo's habits lies through an intensive study of its eggs *in situ*.

My first awakening to the possible revelations which might be the reward of any one prepared to devote sufficient time and patience to the watching of the Cuckoo came through reading an article by E. E. Pettitt in *Wild Life* for 1915. In that paper the writer gave an account of his investigations amongst Cuckoos parasitic upon Reed Warblers,* showing that individual hen Cuckoos occupied particular breeding areas, usually of no great extent, in which they deposited their eggs. This conclusion was arrived at through noticing that eggs of any one type were always found in a given area and never in others.

Subsequently I came in contact with my friend O. R. Owen, of Knighton, who had, in the year 1916, found a number of eggs of several Cuckoos in nests of Meadow Pipits (*Anthus pratensis*, L.). Having myself also acquired some direct evidence of the accuracy of the territorial theory as applied to the Cuckoo, I began, in 1918, a close study of the bird, choosing for my scene of operations a small common in one of the Midland counties, where, two seasons previously, a Cuckoo had been found to be victimising the Meadow Pipits thereon. My observations have been continued during each

* *Acrocephalus streperus*.

succeeding season. By 1920 I had gained sufficient knowledge of the ways of the Cuckoo to make possible the successful filming of her actions in 1921. A perusal of the detailed account of my experiences will show clearly how that consummation was reached and will throw light upon many points which have hitherto been either obscure or unsuspected.

In a paper published in the *Ibis* of April, 1917, Major R. F. Meiklejohn (who was wounded and taken prisoner during the retreat from Mons) eloquently expressed the difficulties of finding really satisfactory conclusions to the fascinating Cuckoo problems. On that account I quote his preliminary remarks in full--

“ In the ignorance which still prevails regarding many details of the breeding habits of the Cuckoo, we have a good object lesson of how well Nature is able to guard her secrets, since, after years of careful and methodical investigation by distinguished naturalists, comparatively few authentic facts have been established.

“ Theories, indeed, have multiplied exceedingly, as is inevitable when facts are few. Many of these theories verge on the fantastic, while others have been evolved by an apparent confusion of cause and effect, and facts have been twisted to fit them.

“As a result, it is not difficult to understand that the Cuckoo is regarded by many people as being absolutely distinct from all other species in its habits and as possessing many extraordinary endowments to assist it in its parasitical methods of reproduction.

“The difficulties in obtaining any conclusive information on many points are, indeed, so great that it is not easy to see how they can be overcome. In addition to the initial impossibility of identifying one female from another, the male in this species unfortunately resembles his mate so closely that it can only be distinguished from a distance by the note, while its polygamous habits and the fact that, unlike other birds, it is not more or less tied down to the vicinity of its nest, makes observation of any specific female, and a computation of the numbers resident in any district, an almost hopeless task.

“Consequently, it seems that if we are ever to solve the problem it must be by a combination of lucky chances, and by carefully piecing together, as in a detective mystery, the various clues which come into our possession ; and it is thus of great importance that no available information shall be overlooked or remain unknown.”

Now this “combination of lucky chances” undoubtedly fell my way. At the same time similar opportunities should be available to any one

who will give the necessary attention to the matter. My own observations cannot but be helpful to those who wish to find out the truth about the Cuckoo for themselves, although they will gather from these pages how great is the amount of work involved in the successful forecasting of a Cuckoo's actions.

CHAPTER II

THE FIRST SEASON (1918): RECORD OF OBSERVATIONS

AT the beginning of the season of 1918 I had no definite plans for a close study of the Cuckoo, and it was not until the end of May that I was struck with the continuous calling of several birds about a small common near which I was engaged during evenings and week-ends in searching for nests of the Tree Pipit (*Anthus trivialis*). Recollecting that, two seasons previously, there had been found in Meadow Pipits' nests on this very common five eggs obviously laid by one Cuckoo, and a sixth egg by another, it dawned upon me that this was an ideal place in which to begin my investigations. For here I had a small and comparatively open piece of ground under a mile in circumference. On most of three sides it is bordered by forest, on the remainder by orchards, and here and there are trees placed as if on purpose to provide ideal observation posts for Cuckoos. The configuration of the ground is of a gently undulating

VIEW OF THE COMMON, SHOWING THE "CENTRE ORCHARD."

(Trees: A—cherry; B¹—pear; C—pear.)

nature supporting a growth of young gorse and bracken varied by barer patches where at one time and another the common has been set on fire by mischievous village children.* Greatest advantage of all is that it is an isolated breeding ground of Meadow Pipits, the chosen fosterers of the Cuckoos in occupation. There is no other breeding ground of this species within a nearer distance than three miles, and this became a source of particular gratification to me, for I was quickly impressed with the evidence in favour of female Cuckoos occupying particular territories in which they are, so far as circumstances permit, parasitic upon a single species.

In this 1918 season I only devoted to the search such days as opportunity offered from June 3 onwards. On the evening of that day I had not been on the common for more than half an hour, when I flushed a Meadow Pipit from a nest containing two of her own eggs and one of a Cuckoo. (Henceforward I shall refer to this bird as Cuckoo A, and, when necessary, distinguish any of her eggs by a small numeral following the capital letter.) The three eggs were taken, and the Pipit subsequently laid two more in the empty nest and then

* See plans, pp. 106, 150, and photograph facing p. 14.

deserted, thus making $4 + A^1$. Within an hour I found a second Meadow Pipit's nest containing two eggs and another of the same Cuckoo, A^2 . All the eggs in both these nests were fresh.

Gratified with the result of my first hunt, I eagerly pursued the search on the following evening, June 4, when I discovered the nest of a Skylark* with $2 + A^3$, fresh. I was pleased to see that this Cuckoo A was laying an egg of a very distinctive type, so much so in fact that I have yet to see others with which it could be confused. It was clear that these three eggs of Cuckoo A must have been, since they lacked signs of incubation, laid within a very few days of each other.

The following week-end I spent some time searching the ground, but drew a blank, and it was not until June 15 that I found a Meadow Pipit's nest with $2 + A^4$, these eggs also being fresh. The approximate position of this nest was betrayed by the behaviour of the male Pipit; and, beating over the likely herbage, I soon succeeded in flushing the female. One of the Pipit's eggs was pierced with two holes on opposite sides of the shell, and I am of the opinion that they were made by the Cuckoo when laying in the nest.

* *Alauda arvensis*, L.

Although myself unaware of the fact until long afterwards, I will here anticipate matters by saying that Cuckoos lay actually in the nest when Meadow Pipits are the dupes, and full descriptions will be found in ensuing chapters of those occasions on which we watched them doing so.

On the following evening, June 16, a friend accompanied me to the common. Later we were joined by Mr. F. Simmonds, a local resident, who had for some years displayed an interest in my ornithological pursuits. A collie came with him, and it was soon evident that the presence of the dog was very agitating to the Meadow Pipits, and probably helped us to an hour of crowded success. The first discovery was a Meadow Pipit's nest with $3 + A^5$, the eggs being about four days incubated. Quickly we found a second nest with $4 + A^6$, these being about five days incubated. A third nest contained one fresh egg of a Meadow Pipit and one of another Cuckoo which I shall call B. I happened to be carrying some addled eggs of a Tree Pipit, and as it occurred to me that this was the first nest I had found of a Meadow Pipit *without* an egg of Cuckoo A, I substituted for the eggs of pipit and Cuckoo B, two of the Tree Pipit's addled ones, thus securing a sporting chance of A yet placing

an egg in the nest. The next morning I visited it and removed a second Meadow Pipit's egg which had been laid with the two substituted eggs.

I was unable to get to the common again until the 21st, when I went straight to this nest. My anticipations were realised to the full, for there was A⁷ with only one of the substituted eggs. The Meadow Pipit had deserted.

On June 22 I found another Meadow Pipit's nest containing a lusty young Cuckoo, about six days old, almost certainly hatched from one of the earlier eggs laid by A, my favourite Cuckoo. That this is entitled to be called A⁸ will be shown by collateral evidence as the story of this Cuckoo unfolds. This was a most interesting nest, inasmuch as it gave one to wonder how that young Cuckoo ever managed to eject the rightful occupants. It was in a hole quite six inches deep, and even when the young interloper was almost ready to fly, its back was well beneath the surface of the ground.

Later on the same afternoon I flushed a Meadow Pipit from her nest, in some bracken, containing one of her own eggs plus A⁹ and B². These eggs had been incubated about six days.

Next day, June 23, I spent many hours searching

fruitlessly, and was just about to give up for the day when I noticed a male Meadow Pipit perching on some dead bracken and holding a grub in its bill. Watching the bird until it dropped down on to the ground, I walked to the spot and soon flushed the sitting female. The nest was in very short grass and sprouting gorse but skilfully concealed beneath the shelter of two burnt twigs. It contained $3+B^3$. For these I substituted three other eggs, to which the Pipit laid a fourth and then deserted.

It is my experience that a Meadow Pipit is particularly liable to desert her nest when a Cuckoo's egg is removed *without being replaced* by an egg of corresponding size, such as that of a Skylark, but she often finishes laying her clutch before doing so.

On June 29 I had a blank day, and feared another on the 30th, but just as we were about to abandon the hunt I put up a Meadow Pipit from a nest holding three of her own eggs plus A^{10} and B^4 , these eggs being some four days incubated. This nest was of particular interest to me for the reason that a week previously I had watched a Cuckoo, which was itself watching a Meadow Pipit, close to this particular spot. The Cuckoo sat in a tree

in an adjoining orchard about 100 yards from where the cock Meadow Pipit was continually settling. At length, the Cuckoo dropped down into the bracken and gorse, apparently alongside the Pipit. In a few moments the Cuckoo rose and, pursued by the Meadow Pipit, flew away across the common. Then the Pipit returned, and on that day and the next showed much concern whenever I approached. Although I hunted over the ground again and again, I persistently failed to find the nest before flushing the sitting bird this day (30th). It was about 6 p.m. on the previous occasion when I saw the Cuckoo fly down to the ground, and, in the light of subsequent experience, I have little doubt that she then laid her egg.

At this early date in my investigations I began to see a probable solution of the puzzle of how it comes about that just when a Cuckoo wants to lay she finds a nest in a fitting condition to receive her egg. It is obvious that there is only a period of a few days when any nest is a suitable receptacle for a Cuckoo's egg, since it is only exceptionally that a Cuckoo will make use of a nest in which the eggs are already undergoing incubation. From my observations on Cuckoos A and B during this season I formed the theory that it is the Cuckoo's

habit first to seek out, by the process of watching its dupes, the nests suitable for its eggs, and, having done so, to lay its eggs on dates that coincide with those on which the nest is in a favourable condition.

From the study I had made of other species, particularly of the Red-backed Shrike (*Lanius collurio*, L.), I had proved conclusively that if a nest be destroyed the bird will almost immediately begin to build another nest and will often lay the first egg of its new clutch on the fifth or even the fourth morning after losing its first nest. This being an ascertained fact, it seemed to me probable that a Cuckoo was quite likely to develop its eggs within four or five days after finding the nests of its dupes in the process of being built. We shall see later how this theory eventually proved to be in the main correct.

On June 30 I found the only Meadow Pipit's nest which came under my observation that did not ultimately contain an egg of either of the Cuckoos frequenting the common.

Being anxious to make the results of the season as complete as possible, I devoted July 5, 6, and 7 to a comprehensive search. I found that I had missed one nest, for on the evening of the 6th we

watched a pair of Meadow Pipits with grubs in their beaks. They were obviously anxious to go to their nest. In the case of Pipits the parent birds will seldom, when realising that they are under observation, fly directly to the nest but prefer rather to run to it from a distance, thus being lost to view in the herbage. However, I was able roughly to locate the whereabouts of the nest of this pair, and soon found it with a lively young Cuckoo about six days old. That this was A¹¹ I am now fully satisfied, as will be shown by the evidence which I shall adduce regarding the laying sequences of Cuckoos. I was annoyed at having previously missed this nest, for on June 23 I had seen what was undoubtedly the hen bird anxious to return to it, but having at the time, at a distance of about 70 yards away, only just disturbed another Meadow Pipit from her nest containing a Cuckoo's egg, I wrongly concluded that the anxious hen Pipit owned the nest I had found. On several occasions I had passed within four yards of the nest which now held the young Cuckoo.

The subjoined summary of the 1918 investigations is based for the most part upon the foregoing notes. At the same time, it must be borne in mind that subsequent experiences give a stronger basis

FIRST SEASON (1918): RECORD 23

for the assumptions than the reader might gain from a perusal of the present chapter.

SUMMARY OF 1918 INVESTIGATIONS

Cuckoo A

Egg.	Date when found.	Fosterer.	Presumed date of laying.	Presumed order of laying.	Remarks.
A ¹	June 3	Meadow Pipit	June 3	4th	
A ²	" 3	"	" 1	3rd	
A ³	" 4	Skylark	May 30	2nd	
A ⁴	" 15	Meadow Pipit	June 13	8th	
A ⁵	" 16	"	" 9	6th	
A ⁶	" 16	"	" 7	5th	
A ⁷	" 21	"	" 17	10th	In nest from which B ¹ had been taken on June 16
A ⁸	" 22 (Young Cuckoo)	"	May 28	1st	
A ⁹	" 22	"	June 15	9th	Found with B ²
A ¹⁰	" 30	"	" 23	11th	Found with B ⁴
A ¹¹	July 6 (Young Cuckoo)	"	" 11	7th	

Cuckoo B

B ¹	June 16	Meadow Pipit	June 14	1st	A ⁷ was afterwards laid in this nest
B ²	" 22	"	" 16	2nd	Found with A ⁹
B ³	" 23	"	" 20	3rd	
B ⁴	" 30	"	" 22	4th	Found with A ¹⁰

CHAPTER III

THE SECOND SEASON (1919)

THE season of 1919 was eagerly awaited, as I felt confident that I should acquire considerable knowledge concerning the mysterious habits of the Cuckoo. Last year's experiences suggested to my mind that the number of eggs that a Cuckoo might lay in a season would largely depend upon the number of available nests of that species which Nature inclined her to victimise, the species presumably being that which had acted as her own foster-parents. And having collateral evidence of the tendency of Cuckoos to return annually to the same territory, I visited the common on May 11 for the purpose of removing any Meadow Pipits' nests which might be in such a condition that they would be useless to the Cuckoo should she return. I was thinking of Cuckoo A to the exclusion of Cuckoo B, for I already regarded the common as the proper territory of the former bird. On this my preliminary visit two incubated clutches of

Meadow Pipits' eggs were taken away, this of course compelling their owners to build and lay again.

On the evening of May 18 I was again on the common, and found a Cuckoo's egg alone in a Meadow Pipit's nest. In every respect this egg was exactly similar to the distinctive series of nine taken last season, so I was rejoiced to find that my favourite Cuckoo A was back again. I substituted for her egg one of a Meadow Pipit, but no more were laid in the nest, which, to judge by the behaviour of the owner, was not deserted when found. Probably she resented the substitution of a smaller egg.

On May 22 I found A² in a Meadow Pipit's nest with three eggs about two days incubated. Later in the same day I took A³ plus four fresh eggs of a Meadow Pipit from a nest which had contained three of its rightful eggs on the 20th.

On May 28 I found A⁴ with four fresh eggs of a Meadow Pipit in a nest under a small hummock; from the actions of the Pipits I had six days before felt sure that there was a nest near by. On the same day I took A⁵ from a Meadow Pipit's nest with three fresh eggs. It is interesting to note that this fifth egg, as in the case of the fifth egg of next

year and in no others, bore a small black crescent on the larger end.

On May 31 I took A⁶ in a Meadow Pipit's nest in short grass. This nest was first found on the 29th when it contained three eggs. On the 30th at 10.30 a.m. it held four eggs. I then removed one and on returning on the evening of the 31st there were three eggs plus A⁶.

On June 3 A⁷ was found alone in a Meadow Pipit's nest. This I exchanged for the egg of a Skylark to which the Pipit laid four. On the 8th I took A⁸ from a Meadow Pipit's nest with one egg. I substituted for these a Skylark's and another Pipit's egg, and the fosterer in due course laid three more eggs.

Being most anxious to *see* the Cuckoo deposit her egg, accompanied by Simmonds I slept—or rather stayed—out on the common on the night of June 11, hoping that by being on the spot from dawn onwards I should be favoured by Fortune and witness the performance. It was, however, not to be. But at 6 a.m. on the 12th we found A⁹ in a Meadow Pipit's nest with four eggs in a tuft of grass. The eggs were about eight days incubated and the nest was the “repeat” one of that from which I took A² on May 22. At 11 a.m. I took A¹⁰ quite fresh

and alone in a Meadow Pipit's nest within a hundred yards of the spot where I had passed the night for the express purpose of seeing the deposition.

On June 21 I found A¹¹ in a Meadow Pipit's nest, with two eggs, well concealed in gorse. This nest was being built on the 17th. On the same afternoon Simmonds found another Meadow Pipit's nest containing A¹² in the shape of a naked young Cuckoo. Outside the nest were two young Meadow Pipits which had obviously been dead only a few hours. This nest was in exactly the same spot whence a Cuckoo had been seen to fly almost three weeks previously.

The 22nd yielded A¹³ and two fresh Meadow Pipit's eggs in a nest in a small hole not far from where the young Cuckoo last year was reared in a nest in a hole. These eggs appeared deserted when found, as the nest was quite wet and the eggs damp, although there had been no rain for many hours. I was determined to find this nest because eight days previously I had seen twice in a quarter of an hour the hen bird carrying nesting material, and had subsequently spent much time fruitlessly searching. Later in the day I flushed another Meadow Pipit from a nest in short gorse growing through old burnt sticks. This contained A¹⁴ and

four of the fosterer's eggs about one day incubated. Still later, A¹⁵ was discovered in another Meadow Pipit's nest with four eggs about three or four days incubated. This nest was in a large patch of evenly growing gorse, and a week previously we had searched in vain for a nest here, but it was not discovered until the bird was flushed to-day.

On June 23 I found A¹⁶ in a Meadow Pipit's nest. The egg was intact but firmly stuck to the bottom of the nest by the contents of the two or three broken Pipit's eggs of which only fragments of the shells remained. The nest, and egg when blown, bore every appearance of having been deserted for some time between a week and a fortnight.* On the 28th another Meadow Pipit's nest was found containing A¹⁷ in the shape of a young Cuckoo about two days old. One of the Pipit's eggs was still in the nest and three others were lying outside.

* I am of the opinion that in this instance the female Meadow Pipit was brooding her eggs—as is so often the case—when the Cuckoo approached to lay, and instead of flying off fluttered on the nest and, in her attempts to ward off the Cuckoo, broke her own eggs. Or possibly when the Cuckoo went on to the nest, the Pipit followed her, as we saw in the case of the filming of the Cuckoo's 14th egg in 1921, and between them they broke the eggs, and the Cuckoo's egg being laid in the nest would naturally adhere to the nest and its broken contents.

July 5 saw the discovery of A¹⁸ in a Meadow Pipit's nest with four eggs in a tuft of grass. All the eggs were near hatching. This nest was close to the persistent perching ground of the male Pipit, who throughout the season had been almost incessantly singing whenever I was on the common. I had wrongly concluded that I had found the nest of this bird thirteen days before at some little distance away, and was only led to hunt for the nest this afternoon by seeing both birds fussing about suspiciously. After watching them for a few minutes, I saw the male get up and fly away, satisfying me that the female had gone to the nest. Beginning to beat the gorse, I soon flushed her from her nest within ten yards of where she had last been seen.

To-day, July 5, was also noteworthy in that it provided the best of all evidence of the return of Cuckoo B. On June 29 I had found a Meadow Pipit's nest with two eggs, and at 8 p.m. that day, just as I was leaving the common, I saw a Cuckoo, chased by a Pipit, fly off from just beside this nest. I was surprised, as by that time I had made up my mind that the Cuckoo I had been studying had finished laying. The next morning, June 30, at 9.15, the nest contained three eggs of the Pipit.

Visiting it on July 5 it contained B¹ plus four eggs of the Meadow Pipit about three days incubated. The facts concerning this nest will be recalled later, as they provide contributory evidence both as to Cuckoos visiting nests before depositing and in support of a theory which I shall elaborate on "dominant" Cuckoos.

In another Meadow Pipit's nest I found B² with three eggs of the fosterer, all some four days incubated. These two eggs discovered to-day were all that were seen of Cuckoo B during this season, and it will be noticed that she did not begin to lay until Cuckoo A had finished. It will be further observed that although there were many Skylarks, Tree Pipits and other species of small birds on the common, no egg of *either* of these Cuckoos was found in any but nests of the Meadow Pipit.

SUMMARY OF THE 1919 INVESTIGATION

Cuckoo A

Date when egg found.	No. of egg.	Fosterer.	Presumed date of laying.	Presumed order of laying.
May 18	A ¹	Meadow Pipit	May 18	1st
" 22	A ²	"	" 20	2nd
" 22	A ³	"	" 22	3rd
" 28	A ⁴	"	" 24	4th
" 28	A ⁵	"	" 26	5th
" 31	A ⁶	"	" 30	6th
June 3	A ⁷	"	June 3	8th
" 8	A ⁸	"	" 7	10th
" 12	A ⁹	"	" 1	7th

THE SECOND SEASON (1919)

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Cuckoo A—continued.

Date when egg found.	No. of egg.	Fosterer.	Presumed date of laying.	Presumed order of laying.
June 12	A ¹⁰	Meadow Pipit	June 11	12th
" 21	A ¹¹	"	" 19	16th
" 21	A ¹² (Young Cuckoo)	"	" 5	9th
" 22	A ¹³	"	" 21	17th
" 22	A ¹⁴	"	" 17	15th
" 22	A ¹⁵	"	" 15	14th
" 23	A ¹⁶	"	" 9	11th
" 28	A ¹⁷ (Young Cuckoo)	"	" 13	13th
July 5	A ¹⁸	"	" 23	18th

Cuckoo B

July 5	B ¹	Meadow Pipit	June 30	2nd
" 5	B ²	"	" 28	1st

Now a detailed perusal of the above table will show that Cuckoo A laid an egg on every alternate day except for a gap between May 26 and 30. It will, of course, be objected here that these presumed laying dates are guesswork, which in many instances they admittedly are. But it is guesswork founded on very good data, such as previous knowledge of nest, contents, and state of incubation of the eggs when blown. Moreover, they are strongly supported by the *proved* regular laying of Cuckoo A in her next season.

In order to make the story for 1919 as complete as possible I give here particulars of three eggs from three other Cuckoos found on the confines of the common. They were not mentioned in the detailed record as these three birds were obviously

not parasitic upon Meadow Pipits and so were not within the scope of our investigation.

Initial letter of Cuckoo.	Fosterer.	Date found and number in clutch.	State of incubation.
C	Hedge-Sparrow	3 + C May 28	Fresh
D	Pied Wagtail	4 + D ² June 13	Two days
E	Tree Pipit	4 + E „ 22	One day

The eggs of these three Cuckoos are different from one another and utterly unlike those of Cuckoos A and B. Another egg of D, in a Pied Wagtail's * nest, 1 + D¹, was found on June 1 some half a mile distant. A Cuckoo tending to dupe this Wagtail must of course, from the comparative infrequency of nests, range over a wide territory if she is to lay a large number of eggs in a season.

* *Motacilla lugubris*.

CHAPTER IV

THE THIRD SEASON (1920): PRELIMINARY NOTES

WITH the coming of the spring of 1920 we had the following material acquired during 1918 and 1919 upon which to work :—

We had found and taken nine eggs in 1918, and sixteen eggs in 1919, which were all undoubtedly the produce of Cuckoo A, because all the twenty-five eggs bear an unmistakable similarity to one another, and all were discovered in the same restricted area. Each egg was laid in a different nest, and yet twenty-four of the twenty-five nests were those of the Meadow Pipit, the one exception being that of a Skylark. There is also very little room to doubt that the two young Cuckoos found in 1919 in nests of Meadow Pipits were the offspring of Cuckoo A.

Be it noted once more that all these nests were on a small common not quite a mile in circumference, more or less covered with short gorse and ideal as a nesting ground for Meadow Pipits. It is so far isolated as to be about three miles distant as

the crow—may I say the Cuckoo?—flies, from other suitable ground for this species of Pipit.

It is obvious that only by finding *every* egg of the Cuckoo as laid would it be possible to establish absolute proof of the theory resulting from last season's study, when I attempted to show that Cuckoo A had laid her eggs on alternate days. Until we knew for certain how often the Cuckoo laid, it would not be possible for us effectively to lie in wait for her to come and deposit her egg; and again, until we had seen her lay and deposit an egg, we could not tell at what time in the morning, afternoon, or evening she was accustomed to perform this function. If we were desirous—as we were—of finding *all* the eggs laid by this particular Cuckoo, should she return (as she did) for another season, it was first of all necessary to find *all* the Meadow Pipits' nests on the common, and to keep taking them after they had reached such a stage of incubation as made them no longer attractive to a Cuckoo. Further, we had so to adjust matters that fresh nests would constantly be built, thus providing every incentive to the Cuckoo to continue to lay and deposit all her eggs in the nests of the Meadow Pipits on the common. Moreover, by keeping a daily watch on each nest found we hoped

to be able to ascertain upon which dates the Cuckoo deposited her eggs.

Yet again, if we were to see how many eggs a Cuckoo would lay in a season under ideal * conditions, it was necessary, having ascertained at what intervals, regular or otherwise, she laid, to use our best endeavour to arrange matters so that a new Meadow Pipit's nest would always be in readiness for the Cuckoo upon the recurrence of every ascertained interval.

In the strong hope that Cuckoo A would return, I was anxious to prevent any of the Meadow Pipits hatching prior to her advent, and so made preliminary searches of the common on May 2, 5, and 9, with the result that six clutches of Meadow Pipits' eggs were found and taken. It subsequently transpired that the search had been completely effective, for no nests which then existed had escaped our notice.

On May 15 the first egg of Cuckoo A was found in a Meadow Pipit's nest, and from that moment onwards I resolved with increasing fervour as the season progressed to leave no stone unturned

* "Ideal," that is, from a scientific point of view; the conditions, as will be seen, were artificially created, and were abnormal from the Cuckoo's point of view.

to secure every egg she might lay, and to give her every opportunity to lay the maximum number of eggs of which she was capable.

It soon became obvious that in order to achieve success the precise number of pairs of Meadow Pipits nesting on the common must be definitely ascertained, and that each pair must be identified and singled out for attention throughout the whole season. The preliminary searches had given us reason to think that there were only six pairs in residence, but the close attention given daily after the Cuckoo had begun to lay soon revealed the presence of nine pairs of Meadow Pipits. Incidentally I had roughly calculated last season that there were then not more than ten pairs in residence.

It is now coming to be recognised as a well-established fact that in the case of all the smaller birds which breed in Britain, and probably elsewhere as well, from the time a first nest of eggs has been taken or destroyed, a lapse of five days or a few more is all that is necessary before that same pair of birds can be relied upon to have built another nest in the same vicinity. (The word "territory" will be used in that connection.) As I have stated already, personal experience of a great number of nests of the Red-backed Shrike has

THIRD SEASON (1920): PRELIMINARY 37

taught me that, at least as often as not, this species will lay its first egg of a second, a third, occasionally a fourth, and even a fifth clutch, on the *fifth* morning after the destruction of its previous nest. Meadow Pipits may normally be expected to have a new nest with one or more eggs by the eighth day.

Now whereas the eggs of different Meadow Pipits are often difficult to distinguish, and never show such contrasts as do the eggs of Tree Pipits, it is also a curious fact that those laid by the same individual Meadow Pipit, whether in the same or consecutive nests, sometimes vary. This fact greatly complicated the task of identifying the layings and relayings of each of the nine pairs. Nevertheless we placed identification before long upon a sure footing, not only by keeping a careful daily record of all observations made upon each pair of Meadow Pipits and upon each nest found, but also by calling to our aid the process of elimination. In this manner we provided a double check whereby we knew when we had found all the nests available on any particular day. So soon as it became a matter of certainty that there were nine, and only nine, pairs of Meadow Pipits, they were numbered for reference purposes in the order of

their breeding territories from north-east to south-west across the common. A study of the detailed record, which follows, of the nidification timetable of each pair of Meadow Pipits, will satisfy any experienced ornithologist that there has been little or no confusion between the different pairs.

As we discovered the Cuckoo to be laying only on each alternate day, it is apparent that so long as there were nine pairs of Meadow Pipits it was not necessary to "restart" each so soon as a complete clutch of eggs had been laid. ("Restarting" a nest, of course, means removing all the eggs and thus causing the birds to set about building again.) In fact, to restart more than one pair every forty-eight hours (or, to allow for accidents, rather more frequently than that) would only provide the Cuckoo with more suitable fosterers than she would require, and when we did so we not only imposed upon ourselves the additional burden of finding added nests, but also—what was far more important—made it more difficult accurately to foretell in which particular one the Cuckoo would lay her next egg.

The Cuckoo's egg was always taken as soon as found for fear of accident, but, except when circumstances threatened an insufficiency of Meadow

THIRD SEASON (1920): PRELIMINARY 39

Pipits' nests, each fosterer was usually left either with some of its own, or some other substituted eggs in exchange, until it had laid its full clutch.

NIDIFICATION TIME-TABLE OF THE NINE PAIRS OF MEADOW PIPIT FOSTERERS IN 1920

N.B.—The figure in parentheses after the Nest, *e.g.* "First Nest (4)," gives the total number of eggs laid by the foster-birds in that nest. The site of each nest may be seen on the plan, p. 106.

NO. 1 PAIR OF MEADOW PIPITS

FIRST NEST (4).

Sunday, May 2, 1920.—Found this nest containing four eggs and restarted it. Incubation not noted.

SECOND NEST (5).

Saturday, May 15, 1920.—Found on this date containing two Pipit's eggs and the second egg laid by Cuckoo A (this was the first egg of this Cuckoo's series to be found).

Monday, May 17, 1920.—Restarted this nest after the fifth egg had been laid.

THIRD NEST (5).

Sunday, May 23, 1920, 3 p.m.—Found with one fresh egg. Later that afternoon Cuckoo A must have deposited her sixth egg which we discovered in this nest at 8 a.m. next day.

Thursday, May 27, 8 a.m.—Restarted the nest after laying of fifth egg.

FOURTH NEST (5).

Friday, June 4, 3 p.m.—The whereabouts of this nest was disclosed by the Cuckoo in the act of deposition at this hour,

but owing to its clever concealment the nest, containing two eggs and the twelfth egg of Cuckoo A, was not actually found until 8 p.m.

Sunday, June 6.—Fifth egg laid.

Tuesday, June 8.—Nest restarted.

FIFTH NEST (5).

Tuesday, June 15.—The Cuckoo disclosed the location of this nest to Frankie Simmonds by flying down at 3 p.m. when it contained two eggs.

Friday, June 18, 3 p.m.—The nest was observed to contain five fresh eggs at this hour, immediately preceding the deposition of Cuckoo A's eighteenth egg.

Up till the last clutch of this fosterer the eggs had been unusually uniform in marking, but in the last nest two of the eggs were entirely different in size and colour.

Close observation for the remainder of the season proved that this pair made no attempt to build a sixth nest.

NO. 2 PAIR OF MEADOW PIPITS

FIRST NEST (4).

Sunday, May 2, 1920.—Found this nest containing four eggs and restarted it. Incubation not noted.

SECOND NEST (4).

Friday, May 21, 1920.—Found by Frankie Simmonds containing four eggs, probably already incubated. Left bird sitting.

Wednesday, May 26.—Restarted by transference of her eggs to nest of a Whinchat, which however deserted.

Shortly afterwards this pair mysteriously disappeared; presumably destroyed by the Kestrel (*Falco tinnunculus*, L.), referred to elsewhere.

THIRD SEASON (1920): PRELIMINARY 41

NO. 3 PAIR OF MEADOW PIPITS

FIRST NEST (5).

Wednesday, May 5, 1920.—Found on this date with five eggs. Left to incubate.

Sunday, May 9.—Restarted.

SECOND NEST (4).

Friday, May 21.—Saw the female building but could not find the nest.

Tuesday, May 25.—O. R. Owen found the nest with two eggs.

Wednesday, May 26, 4 a.m.—Nest contained one egg and the seventh egg of Cuckoo A, wet with dew, therefore obviously deposited the previous afternoon. This is evidence that the Meadow Pipit did not remain at her nest during the night. At 6 a.m. we flushed the Pipit from the nest and found she had laid a third egg.

Saturday, May 29.—Restarted her two days after the fosterer had laid her fourth egg.

Subsequently the pair were never again seen together, the female presumably falling a victim to the Kestrel. The male, obviously a widower, was observed about for the next two or three weeks, then entirely disappeared. On one occasion we saw him walking about feeding with No. 4 male, also mateless, just as though they were a pair, and after a time both rose in the air and sang simultaneously.

NO. 4 PAIR OF MEADOW PIPITS

FIRST NEST (5).

Sunday, May 2, 1920.—Found with five eggs and restarted; incubation not noted.

SECOND NEST (5).

Thursday, May 20, 1920.—Found by Simmonds containing four eggs of fosterer and an egg of Cuckoo A. (Though presumably actually the first egg to be deposited, it was the third of the series in order of discovery.) The incubation was then from three to four days. The eggs were taken and the nest restarted.

THIRD NEST (5).

Tuesday, May 25.—Watched the female carrying building material and found the nest.

Thursday, May 27, 8 a.m.—The nest contained the first egg of the Meadow Pipit. Before 5.45 p.m. the deposition of Cuckoo A's eighth egg in exchange for the fosterer's egg had been effected. O. R. Owen exchanged the Cuckoo's egg for a substitute.

Friday, May 28, 7.30 a.m.—The Meadow Pipit's second egg had been laid and it was replaced by another substitute.

Monday, May 31, 10 a.m.—Nest restarted after the fifth egg of fosterer had been laid.

The female was never again definitely identified, and mysteriously disappeared. Throughout the remainder of the season the solitary male was always to be found alone singing in the same territory.

On Monday, June 28, catching a female Meadow Pipit on her nest, 10–15 miles distant, we released her in the territory of this male. Our match-making efforts were, however, unrewarded.

NO. 5 PAIR OF MEADOW PIPITS

FIRST NEST (5).

Sunday, May 2.—Found with five eggs.

Sunday, May 9.—Removed eggs and restarted.

THIRD SEASON (1920): PRELIMINARY 43

SECOND NEST (5).

Friday, May 21, noon.—Found by O. R. Owen with three eggs.

Saturday, May 22, 9 a.m.—Nest still contained only three eggs of fosterer with addition of the Cuckoo A's fifth egg.

Monday, May 24.—Restarted this pair, the fosterer having laid her fifth egg yesterday.

THIRD NEST (5).

Saturday, May 29, 7 p.m.—Found by Simmonds ready for eggs.

Sunday, May 30.—First egg laid.

Thursday, June 3.—Fosterer laid her fifth egg and I removed one of them.

Saturday, June 5, 8 p.m.—Fosterer was sitting satisfactorily on the four eggs.

Sunday, June 6.—Both at 10 a.m. and 1 p.m. there were only three eggs in the nest, cold, and the fosterer not sitting. At 3.42 p.m. Cuckoo A flew down to the nest and back to the centre orchard; at 3.45 p.m. she again flew down to the nest and remained for ten minutes, depositing her thirteenth egg and removing one of the three remaining Pipit's eggs. On this date I concluded that the Cuckoo had removed the missing egg between 8 p.m. Saturday and 10 a.m. Sunday, but owing to a similar occurrence with this individual fosterer in connection with the laying of Cuckoo A's twenty-first egg, I am now of the opinion that the Pipit herself may have removed the missing egg, at the same time deserting the nest owing to too much attention on the part of the Cuckoo.

FOURTH NEST (2).

Wednesday, June 16.—At noon Frankie Simmonds found this nest containing one egg. At 5.45 p.m. the same day I

saw Cuckoo A fly up from the nest and, upon inspection, found that she had deposited her seventeenth egg in exchange for the only Pipit's egg. Replaced the Cuckoo's egg with a Pipit's egg.

Thursday, June 17.—In the morning the Pipit had laid her second egg but the only sign of the other egg was the yolk adhering to the newly-laid one. Here again I suggest that, resenting the Cuckoo's intrusion, the fosterer upon returning to her nest after the Cuckoo's visit of the previous evening, may have destroyed the egg I had placed in the nest, albeit using the nest for the laying of her egg the following morning—an almost invariable practice of the Meadow Pipit if eggs are removed before the clutch has been completed. Subsequently the fosterer laid no more eggs in this nest.

FIFTH NEST (2).

Thursday, June 24, 3.45 p.m.—We saw the Cuckoo fly down to the ground and on going to the spot found the Pipit's nest with one egg.

Friday, June 25.—Two eggs of fosterer in the nest.

Saturday, June 26.—In the morning there were still only two eggs, and at 2.45 p.m. the Cuckoo again flew down to the nest but left the two eggs undisturbed. However, at 6 p.m. there was only one egg there, the Pipit again, presumably resenting continual interference, had removed one of her own eggs, although it looked as though the nest had been deserted previously, seeing that a third egg had not been laid that morning.

Sunday, June 27.—There being still only one egg in the nest I removed it and replaced it by four fresh Pipits' eggs brought from C—— Hill (10–15 miles away). Up to 4.30 p.m. the Cuckoo had not been seen again to visit the nest and for the rest of the day a steady downpour set in.

THIRD SEASON (1920): PRELIMINARY 45

Monday, June 28, 1 p.m.—I visited the nest, no rain having fallen that day, and to my great joy found one of the substituted Pipit's eggs removed and Cuckoo A's twenty-first egg lying beside the other three eggs. The nest and all four eggs were quite wet, thus corroborating my surmise that the nest was deserted. The Cuckoo's egg was presumably, from its appearance, deposited before the rain ceased and therefore on Sunday, June 27, after 4.30 p.m.

NO. 6 PAIR OF MEADOW PIPITS

FIRST NEST (4).

Friday, May 21, 1920.—Found about mid-day by O. R. Owen, containing three fresh eggs and the third egg of Cuckoo A. We took these and substituted other eggs.

Saturday, May 22.—The fosterer laid no more eggs, so we removed the substitutes and restarted her.

SECOND NEST (4).

Wednesday, May 26, 7 p.m.—Having seen one of this pair carrying building material in the morning we searched till we found the nest in process of construction.

Saturday, May 29.—The first egg was laid. During the afternoon the Cuckoo was seen to fly down to the nest.

Monday, May 31, 10 a.m.—The nest contained three eggs and at 3.55 p.m. it contained two and the tenth egg of Cuckoo A.

Wednesday, June 2.—We removed the substituted eggs (the Pipit having laid four eggs and incubated them one day) and restarted this nest.

THIRD NEST (5).

Sunday, June 6, 3 p.m.—Two local residents, coming to report the finding of a Wryneck's nest with ten eggs, stumbled across the third nest with one egg.*

* The Wryneck's (*Iynx torquilla*, L.) popular name is "Cuckoo's mate," because it arrives about the same time.

Monday, June 7, 9 a.m.—There was still only one egg in the nest and we feared it had been deserted, which the more disappointed me as we believed (and subsequently proved) it to be the only nest on the common ready for the Cuckoo's attentions.

Tuesday, June 8, 1 p.m.—Upon returning to the nest I was pleased to find two eggs, and at 4.45 p.m. Cuckoo A laid her fourteenth egg, taking away one of the Pipit's eggs. The fosterer subsequently laid an egg on each of the three following days, making a total of five eggs laid in six days.

Thursday, June 10.—Restarted by leaving nest empty, but Pipit laid her last egg in the empty nest the next day.

FOURTH NEST (5).

Wednesday, June 16, 3.40 p.m.—The Cuckoo, after watching this pair of Pipits since 2.20 p.m., flew down to the nest, which we had not previously found. It contained one egg.

Sunday, June 20.—Pipit laid her fifth egg and from 1 p.m. to 1.40 p.m. the male Pipit flew from its nest to the female Cuckoo in cherry tree outside centre orchard and back a dozen times, as though inviting the Cuckoo to deposit an egg. Intermittently till 3.50 p.m. the Cuckoo continued to watch this pair as though intending to lay; but it subsequently transpired she had already that day laid her nineteenth egg in the then unknown nest of No. 8 pair.

Tuesday, June 22, 2.5 p.m.—Cuckoo A flew down to the nest and remained beside it for 31 minutes, completely chilling the eggs which were then two days incubated. She laid her twentieth egg, removing one of those of the fosterer. I took the Cuckoo's and the fosterer's four remaining eggs and restarted immediately.

FIFTH NEST (4).

Tuesday, June 29.—Simmonds found this nest building.

THIRD SEASON (1920) : PRELIMINARY 47

Friday, July 2.—Nest contained one egg.

Sunday, July 4.—Nest contained three eggs to which Simmonds added two further eggs from a Meadow Pipit's nest on C—— Hill.

Tuesday, July 6.—The Pipit was sitting on four of her own eggs and the two from C—— Hill.

Subsequently four young were hatched and reared in this nest.

NO. 7 PAIR OF MEADOW PIPITS

FIRST NEST (5).

Wednesday, May 19, 1920.—Simmonds found nest with three fresh eggs.

Friday, May 21.—Fifth egg laid and incubation started.

Tuesday, May 25.—Removed eggs and thus restarted Pipit.

SECOND NEST (5).

Monday, May 31, 4.30 p.m.—Mrs. Newton found nest containing two Pipit's eggs and the ninth egg of Cuckoo A, which latter had undoubtedly been laid two days previously in exchange for the then single egg.

Wednesday, June 2.—Pipit laid her fifth egg ; removed eggs and restarted.

This pair was never again seen—presumably destroyed by the Kestrel.

NO. 8 PAIR OF MEADOW PIPITS

FIRST NEST (5).

Thursday, May 20, 1920.—Simmonds found nest with two fresh eggs.

Sunday, May 23.—Pipit laid fifth egg and began to incubate.

Friday, May 28, 7.30 a.m.—Gave eggs to a Linnet, and so restarted the nest.

NOTE.—The abnormal interval between the taking of the first nest and building of the second may reasonably be attributed to the Kestrel which, in my opinion, destroyed the female of No. 7 pair and the male of No. 8 pair, the remaining two birds making the new No. 8 pair.

SECOND NEST (4).

Saturday, June 12, 4.30 p.m.—Found nest by seeing Cuckoo A lay her sixteenth egg. Nest then contained one egg of the Pipit and that of the Cuckoo. Exchanged these eggs for two others.

Sunday, June 13, 10 a.m.—Removed the two substituted eggs and the third egg of fosterer laid that morning, as owing to shortage of Pipits it was desirable to restart each remaining pair promptly. Left the nest empty.

Monday, June 14, 11.30 a.m.—Owen visited nest and found Pipit had laid a fourth egg and another Cuckoo had also laid an egg therein. These I removed and no more eggs were laid. This other Cuckoo's egg was laid either on Sunday in the empty nest, or on Monday before 11.30 a.m. In either event the stranger Cuckoo did not remove an egg of the fosterer.

THIRD NEST (5).

Tuesday, June 22, 11 a.m.—Simmonds found nest containing two eggs of Meadow Pipit and the nineteenth egg of Cuckoo A which had evidently been laid on Sunday, the 20th, in exchange for the first egg laid of the Pipit. The laying of the Cuckoo's egg presumably took place at an unusually early hour—prior to 1 p.m.

Thursday, June 24.—Although we had removed the eggs and left the nest empty on Tuesday, the Pipit had completed her clutch of five eggs. Removed eggs and restarted nest.

THIRD SEASON (1920) : PRELIMINARY 49

NOTE.—From the rapidity with which the next nest was built, it seems certain that the act of removing all the eggs from a nest before the clutch has been completed, causes the Pipit to “forsake” even though she may continue to use the deserted nest for the purpose of laying the remaining eggs of her clutch.

FOURTH NEST (3).

Saturday, June 26, 10.30 a.m. to 12 noon.—Observed the Cuckoo watching this pair building their fourth nest and when she had flown away *without* visiting the nesting site (the Cuckoo never victimised this nest) we found the nest apparently approaching completion.

Wednesday, June 30.—First egg laid.

Friday, July 2.—Only two eggs laid.

Sunday, July 4.—Three eggs laid and bird sitting. Added two more fresh eggs from C—— Hill.

Subsequently two young were hatched and reared from this nest.

NO. 9 PAIR OF MEADOW PIPITS

FIRST NEST (4).

Wednesday, May 5, 1920.—Found nest with four eggs ; removed eggs and restarted.

SECOND NEST (3 or 4).

Wednesday, May 19.—Simmonds found nest containing one egg of fosterer and the second egg found of, but presumably the fourth laid by, Cuckoo A. Replaced by two other Pipit's eggs.

Friday, May 21.—Took another egg of the fosterer ; removed substitutes and restarted.

THIRD NEST (4).

Tuesday, May 25, 6 p.m.—Found building.

Sunday, May 30.—First egg laid. At 10 a.m. the Cuckoo was seen to fly from vicinity of nest.

Wednesday, June 2, 2.35-2.45 p.m.—Cuckoo made four continuous flights from tree in forest to site of nest ; worried by Pipits. At 4.30 p.m. Cuckoo A laid her eleventh egg, removing one of the fosterer's four eggs. Took eggs and restarted.

This pair subsequently entirely disappeared ; presumably destroyed by the Kestrel.

CHAPTER V

THE THIRD SEASON (1920): RECORD OF OBSERVATIONS

AFTER the preliminary work described in Chap. IV my next visit to the common was on the evening of Saturday, May 15. I was accompanied by Mr. Ward Price of the Paris *Daily Mail*, Mr. Ronald Walker, of March, and the two Simmondses, father and son, who it will be remembered are local residents, and for whose consistent efforts and interest I shall always be grateful.

The first find of importance was a Linnet's nest containing three eggs and an egg of Cuckoo B, which during the two previous seasons had deposited, to our knowledge, six eggs in this area, all in nests of the Meadow Pipit.

But at 8 p.m.* young Frankie Simmonds found a Meadow Pipit's nest (No. 1 pair) containing two eggs of the fosterer and an egg of Cuckoo A, giving us the extreme satisfaction of knowing that she had

* Summer time, *i.e.* one hour in advance of Greenwich time, is used throughout.

once more returned. Although this was the first egg found this year of Cuckoo A, I am reasonably certain that it was the second actually laid and equally sure that it was laid on this day.

On May 19 a second egg of Cuckoo A was found in a Meadow Pipit's nest (No. 9 pair) with one egg. 7 p.m. was the hour of discovery, and I am convinced that the egg was the fourth of the series to be laid, and that on this day.

On May 20, at 8 p.m., a third egg of Cuckoo A was found in a Meadow Pipit's nest (No. 4 pair) with four of the fosterer's eggs. By all available evidence, such as stage of incubation, and the light of subsequent experience, this egg of Cuckoo A was the first of this year's series and was laid on May 13. The nest was within four yards of the Linnet's nest containing the egg of Cuckoo B, which we had found on the 15th. The incident illustrates how narrowly we then failed to find this nest, and how easy it is to overlook a nest. Hence the value of our "double-check" system (see p. 37).

On May 21 a fourth egg of Cuckoo A was discovered at 11 a.m. in a Meadow Pipit's nest (No. 6 pair) with three eggs. There is no doubt in my mind that it was laid on the 17th, thus being the third egg of the series.

Now Cuckoo A laid these first four eggs before our operations had become sufficiently well organised to admit of the finding of the nests before the deposition of the Cuckoo's eggs. Thus it was that at mid-day on Friday, May 21, we found a nest of what we subsequently identified as No. 5 pair of Meadow Pipits; it contained three fresh eggs of the fosterer. At that stage of our inquiry we laboured under the delusion that the Cuckoo in all probability laid, like her dupes and in fact most birds, in the early morning. Consequently we did not trouble to visit the nest again until about 9 a.m. the next day. Upon finding that it then contained Cuckoo A's fifth egg, we wrongly assumed that she had laid it that morning, whereas, to judge by subsequent experience, it must have been laid on the previous afternoon. The nest contained three eggs of the fosterer as well as that of the Cuckoo. From the fact that the fosterer laid a fifth egg next day, this showed that the Cuckoo had removed one and that the Meadow Pipit had added her fourth egg that morning.

At that time, Saturday, May 22, we were not aware that we had found all the nests then available, and consequently we had no reason to expect to find that Cuckoo's egg where we did. The only

other than possible nests for the Cuckoo were those of pairs Nos. 2, 7, and 8, all of which we systematically visited after we had found them. The nest of No. 2 pair was only discovered (the eggs being obviously well incubated) on the evening of the day upon which the Cuckoo evidently laid her fifth egg in the nest of No. 5 pair. The fifth egg of No. 7 pair and the third egg of No. 8 pair were only laid that morning (May 21), so it was just as likely that the Cuckoo would victimise No. 7 or No. 8 pair as No. 5 pair.

Let us now trace how we were led on to know when and where the Cuckoo would deposit her egg.

At 9 a.m. on Saturday, May 22, we knew that the Cuckoo had deposited since mid-day the previous day what proved to be her fifth egg in the nest of what we subsequently identified as No. 5 pair. At 3 p.m. on the next day, Sunday, May 23, a new nest with one egg of No. 1 pair was discovered. And a visit that morning to the nests of Nos. 2, 7, and 8 pairs of Meadow Pipits showed that the Cuckoo had not yet laid again. Avoiding the common for the rest of the day, for fear that our repeated visits would attract too much attention from the children and cottagers living close by, we returned at 8 a.m. the next morning, Monday,

May 24. The Pipits' nests would then have normally been in the following conditions:—No. 1 nest, 2 eggs; No. 2 nest, 4 eggs incubated; No. 7 nest, 5 eggs, incubated three days; No. 8 nest, 5 eggs incubated since the previous day.

Calling first at No. 1 nest we found the Cuckoo's sixth egg with one egg of the fosterer, the other having been, according to the Cuckoo's custom, removed in exchange for her own egg. We removed the two eggs and gave the fosterer two others to which to lay the remainder of her clutch. The nests of pairs Nos. 2, 7, and 8 we left in case the Cuckoo might need them for her next egg.

Thus far we rightly concluded that the Cuckoo was laying on alternate days, but we still imagined it to be in the early morning instead of in the previous afternoon.

On the morning of the 25th we removed the eggs of No. 7 pair, now four days incubated, thus starting them on the process of rebuilding. We left Nos. 2 and 8, though they were getting less and less likely to be used by the Cuckoo.

Having four days previously seen No. 3 pair carrying nesting material, we searched until Owen found the nest, which contained two fresh eggs. Knowing this to be the only Meadow Pipit's nest

with fresh eggs, we felt confident that the Cuckoo would make use of it for her next egg, but instead of watching all that afternoon (when of course the seventh egg of the Cuckoo was really due to be laid) we determined to get up before daybreak next morning, Wednesday, May 26, and hide up to watch the Cuckoo lay.

Reaching the common by 3.45 a.m., before the sun had risen to dispel a heavy pall of mist which made everything very cold and damp, we first glanced at the nest to see that all was safe. To our amazement we saw the Cuckoo's egg lying alongside only one egg of the fosterer. Upon examination both the eggs were damp and cold, thus proving that the Cuckoo must have laid the previous afternoon or evening, and also that the fosterer had not yet laid her third egg. Visiting the nest at 6 a.m. we flushed the Pipit and by this time she had laid her morning egg. Incidentally this showed that this Meadow Pipit did not sit on her nest at night whilst still in process of laying her clutch—probably few Pipits do.

We restarted No. 2 pair, transferring her eggs to the nest of a Whinchat, which, however, resented the exchange and threw the eggs from her nest. Thus only No. 8 was left available for the Cuckoo's

next egg, unless a nest of No. 4 pair, which we had found being built two days ago, should contain an egg on the morrow, May 27. I had to go to London that day, but before leaving was glad to find that No. 4 Pipit had laid her first egg that morning. So it was arranged for Owen, in my absence, to be on the common by 4 p.m. so as to make reasonably certain, as we then thought, of seeing the Cuckoo lay her eighth egg. Unfortunately a heavy thunderstorm intervened, and when Owen visited the nest at 5.45 p.m. he found that the Cuckoo had already been and left her egg in exchange for the one laid by the fosterer that morning.

On Friday, May 28, the five days' incubated eggs of No. 8 pair of Meadow Pipits were removed so as to restart them nest-building, our intention being to keep a steady stream of fresh fosterers' nests coming on for the service of the Cuckoo.

On Saturday, May 29, a nest of No. 6 pair, which had been found being built three days ago, contained that morning the first of the fosterer's eggs. Believing—wrongly, as it turned out—that to be the only nest available, we felt confident that at last we were going to be rewarded by seeing the Cuckoo show us what she did and how she did it,

particularly as a perfect view of the nest was to be obtained by climbing into a well-leaved cherry tree about 70 yards distant. This tree is marked G¹ on the plan facing p. 106. Henceforward the trees occupied by the Cuckoo will be designated by the letter which represents them on the plan. The various nests of the Meadow Pipits are shown by numerals ; thus 6¹, 6², and so on, represent the first and second nests of No. 6 pair of Pipits. By referring to the plan the reader can the better visualise the movements of the Cuckoo and see at a glance the relationship between particular trees and particular nests. The "centre orchard" is the enclosure containing trees A, B, C, D ; the "east orchard" that containing trees G, G¹, etc.

At 2 p.m. Owen took up a position in the tree whilst I remained below where I could obtain a wider view of the common. To our intense excitement at 3 p.m. a Cuckoo—from the bubbling call on arrival and peculiar behaviour afterwards we soon decided that it was the female—came and settled in the very next tree (G, a pear) to that in and under which we were waiting. For quite ten minutes neither of us dared to move for fear of disturbing her, but gradually I crept behind the tree-trunk and got into a position from which I

could see her through the leaves. She was almost straddled along a thin branch with her keen eyes gazing intently downwards in a direct line for the nest. Suddenly she would start "mewing" in a subdued tone. Whether or no this peculiar sound could be heard by the Meadow Pipits I cannot say, but as she "mewed" so the Pipits, and particularly the male, flew from the vicinity of their nest (6²) and came hovering and fluttering over and around the Cuckoo, darting at her from time to time and apparently causing her to be considerably irritated. At times she yawned, and as she sat there it really looked as though she were resting her rump along the bough. Time and again we felt satisfied that at last we were going to see the Cuckoo reveal her secret. The suspense continued until about 4 p.m. when the Cuckoo was suddenly disturbed by two girls passing under the tree. Imagine our feelings !

Flying away round the corner the Cuckoo soon returned to the same tree, hopped on to the same thin branch, and immediately began watching the Pipits again. At 4.35 p.m. she suddenly launched herself out of the tree, glided gracefully in a direct line down to the side of the nest, the male Pipit accompanying her. Alighting at the nest for a few brief seconds, she rose and flew,

chased by both Pipits, right across the common into the centre orchard. We felt that she could not have had time to lay at the nest, but for all that we then knew she might have thrown up the egg from her throat ; a visit to the nest dispelled any such delusion.

Being more than anxious for the Cuckoo to return it was much to our distress that some boys were now wandering about the common. At 5.45 p.m. the Cuckoo came back to the tree but was disturbed after she had stayed for ten minutes only. At 6.10 p.m. two Cuckoos flew across from the centre orchard, one vociferously "cuckoo"-ing, being obviously a male in close attendance upon a female. They remained in the orchard near us for ten minutes and then flew right away across the forest, shattering our hopes for the day and leaving us more puzzled than ever.

Being joined by the Simmondses towards 7 p.m. we started hunting and found a new nest of No. 5 pair (5³) apparently ready for eggs. Next morning, May 30, this nest contained one egg, and so did a nest of No. 9 pair (9³) which we had found being built on the 25th. On the same morning at 10 a.m. we saw a Cuckoo rise from the ground chased by a pair of Pipits from the neighbourhood of nest 9³.

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Now it is worthy of comment here that the Cuckoo was seen to visit nest 6² on the afternoon of May 29, and fly from the vicinity of nest 9³ on the morning of May 30, and these two nests, as subsequent events show, were respectively used by the Cuckoo on May 31 and June 2. This is mentioned to show that each nest was victimised in the order in which it was seen to be visited by her, though there is, of course, no proof that she had not been to either nest before we observed her visits.

A search for the remainder of the day failed to reveal the whereabouts of the Cuckoo's ninth egg, which, despite our disappointment, we felt convinced had been laid somewhere the previous day.

Owen had to leave on the morning of May 31, and I was unable to reach the common before 4 p.m. Accompanied by another friend I hurried to nest 6² which Owen and I and the Cuckoo had so patiently watched on the 29th. In it we were rejoiced to find an egg (the 10th) of the Cuckoo and two of the fosterer's where we had left three of her eggs that morning. But we were naturally disappointed at having once more failed to see the egg actually laid.

The punctuality with which this tenth egg had been laid satisfied us that the ninth must have been laid on the afternoon of the 29th, so we renewed the search for it with fresh energy. Within half an hour, my friend Mrs. Newton waved to me to come over, and sure enough she had found a nest of No. 7 pair (7²) of Meadow Pipits with two eggs and one of the Cuckoo.

This, then, was the ninth egg of the Cuckoo and evidently laid on the afternoon of the 29th, probably between 5 and 6 p.m. just before the two Cuckoos, the male calling, had come across to us before leaving for good that evening. On that date the fosterer's nest would have contained one egg. We had not watched for the Cuckoo thereabouts, as we had not expected the nest to be so far advanced, having only restarted it four days previously, on May 25.

Thus by the end of May Cuckoo A had already laid, and we had in safe keeping, the first ten eggs of her 1920 series. My hopes now ran high, not only of seeing in what circumstances she laid and placed her egg in the nest, but of beating the known record hitherto held by Dr. Eugene Rey, of Leipzig, of seventeen eggs (at the time I had been led to believe it to be twenty eggs) in one season from

one Cuckoo. But even at this date little did we foresee the measure of success that would crown our efforts, or the fund of information that was to be revealed.

Quite satisfied now that the Cuckoo would only lay on alternate days we gave the common a rest on June 1.

The Laying of the Eleventh Egg, June 2.

Having on so many occasions just missed seeing the Cuckoo actually deposit her egg, I was to-day more than ever determined to do everything possible in order to achieve my desire. Accompanied by a friend, Mrs. Brown, who is the fortunate possessor of an exceptional degree of patience, I reached the scene of operations at 10.30 a.m.

All the indications pointed to the Cuckoo using nest 9³, from the vicinity of which she had been seen to fly on the morning of May 30. The Meadow Pipit should by now have laid her fourth egg, and we found that she had performed her duty according to schedule.

To guard against a further disappointment we placed Simmonds, junr., in a spot where he could command the likely sites of other nests. Mrs. Brown and I took up a position where we could

get a clear view of any visit by the Cuckoo to nest 9³, taking care to avoid placing ourselves where we should interfere with the line of flight, no matter from which of three possible directions the Cuckoo might approach the nest. We settled down at a distance of some 150 yards from the nest, having at least a view—even if a distant one—of the other known available nest—the third of No. 5 pair which now also contained four eggs. It was dull but warm—Derby Day—and brightened as the day wore on. At about 1 p.m. at least three Cuckoos were careering about in the centre orchard, the male birds calling loudly and often.

The hours passed on, not altogether without interest, for a brood of young Great Tits (*Parus major*, L.) ventured from their nest in a hole in the cherry tree A at the corner of the centre orchard; three or four of the youngsters fluttered out and flew on to the common at different points whilst their parents were busily engaged flying backwards and forwards across the common with food. On one of her return visits the parent bird showed obvious alarm at the manner in which the youngsters were scattering themselves, and collected them all together by a call note; it was interesting to watch all the young ones respond to the mother's

call and simultaneously fly back to the parental home.

But nothing of particular moment happened until about 2 p.m. when what proved to be the female Cuckoo singled herself out and flew across to the oak tree (E), which is rather taller than the rest and is situated about fifty yards inside the forest line on the south-west side of the common. This position happened to command a perfect view of nest 9³, but at that time ignorance of the habits of a Cuckoo immediately preceding the deposition of an egg was such that I was unable to derive much encouragement from her action. However, our first thrill occurred at 2.35, when the Cuckoo suddenly glided from her look-out tree with a most unusual and fascinating flight. Apparently accompanied by the Pipits she flew down to the site of the nest and back again to her tree, repeating the performance no less than four times in the next ten minutes. On the last occasion she apparently settled beside the nest for an instant and then flew right away across the forest. I visited the nest, found the four eggs untouched, and then resumed the watch which was now beginning to become wearisome.

At about 3.15 the Cuckoo returned to the

centre orchard from the direction in which she had last been seen to fly. A little later she again flew to tree E and took up precisely the same perch which she had occupied before. Exactly at 4.30 she once again floated out of the tree and settled on the ground for a few seconds, apparently beside the nest. Her flight and visit to the nest were too sudden and of too brief duration to enable me to have my field-glasses in position and watch in hand, so I could neither see nor time the operation as precisely as I had intended. After the few moments spent at the nest, the Cuckoo, chased by one only of the Meadow Pipits (whereas at the nest both were clearly seen fluttering around her), flew away through a neighbouring orchard on the south side and disappeared. Going up to the nest I was rejoiced to find that one of the Pipit's eggs was missing and replaced by that of the Cuckoo, which was still quite warm. Having waited so patiently since 10.30 a.m., Mrs. Brown had gone to get some tea at 4.20 p.m., and so missed seeing the event by ten minutes. Thus at last my ambition had been attained, but the suddenness and the manner of the performance were so far from what I had expected that very much was left to be discovered on subsequent occasions. It was at least certain

that the Cuckoo had laid her egg in or beside the nest, and had removed, without leaving a trace, one of the fosterer's eggs.

The Laying of the Twelfth Egg, June 4.

Yesterday we had given the common a rest in view of the regularity with which the Cuckoo had so far laid her eleven eggs at intervals approximating to forty-eight hours. To-day it seemed probable that the Cuckoo would place her egg in the third nest of No. 5 pair of Meadow Pipits which had completed their clutch of five eggs only the previous day. We knew of no other suitable nest, although it was anticipated that No. 1 pair should be nearly ready with their fourth. Consequently I took up a fairly commanding position in the vicinity of the latter pair, placing the two Simmondses at other points so as to have as comprehensive a view of the common as possible.

I had made no entry in my note-book of the dates on which we had missed seeing some of the fosterers, but our failure to trace them had caused, and was causing, us much perturbation. So we spent the morning searching in vain for them, only gaining the first clue to their disappearance in the

sight of a Kestrel (*Falco tinnunculus*) hovering over the common.

At 1 p.m. we settled down to concentrated watching. At 2 p.m. I took a ten minutes' walk round to ascertain if the Simmondses had anything to report. Again at 3 p.m. I did likewise ; but no one had even seen the Cuckoo since just after 1 p.m. in the neighbourhood of No. 5 territory, when the male Pipit took rather more than usual interest in her movements.

I returned by a circuitous route, and just as I reached my starting point I was startled by a Cuckoo, chased by a Pipit, rising not twenty yards in front of me. Going to the spot whence she appeared to rise and fruitlessly hunting for five minutes or more, I wondered whether I had disturbed her in the act of laying her egg on the ground preparatory to depositing it somewhere or other. So I retreated into a position where I could easily command a view of the particular spot. After watching for half an hour without seeing any sign of the Cuckoo, I had another look round the place whence she had risen, and finding nothing, became disturbed lest the day's proceedings had been marred. The other watchers reported that they had seen nothing, so we dispersed for tea.

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Later in the evening I took Simmonds to make a thorough search of the place I had been watching and where I had seen the Cuckoo in the afternoon. At about 8 p.m. the male of No. 1 pair showed the usual signs of agitation when distressed by one's proximity to a sitting mate, so we set to work to re-beat the gorse. Although I had previously searched and tapped every patch of gorse in the vicinity, Simmonds suddenly called out that he had flushed the hen from the nest, which contained two of her eggs and the coveted twelfth egg of the Cuckoo. This nest, 1⁴, was exceedingly well concealed down a hole entirely overhung by gorse, and was within three yards of where I had thrown my cap at 3.15 to mark the spot whence I believed the Cuckoo to have risen. Obviously she had, on observing my departure at 3 p.m., availed herself of the opportunity to fly down and lay her egg in my absence. Reference to the notes for June 18 and 26 will show other instances of the Cuckoo visiting a nest immediately after some one had left the site.

The Laying of the Thirteenth Egg, June 6.

To-day I was accompanied by Mr. C. F. Bristol, of Edgbaston, whom I had invited to come and

witness the expected laying of the Cuckoo's thirteenth egg. Owing to the recent disappearance of so many Meadow Pipits through the presumed depredations of the Kestrel, there were no nests known to us except 5³, which we had thought might have been chosen by the Cuckoo for her twelfth egg. I had removed one of the five eggs, and when the nest was looked at yesterday the pipit was sitting on the four remaining eggs. On going to the nest early this morning we were surprised to find only three eggs, and though visiting it again later, on neither occasion was the Pipit sitting. We therefore came to the conclusion that something had disturbed her, taken an egg, and caused her to forsake. I mention this because I was within an ace of transferring the eggs to the nest of some other bird in the hope that they might be hatched and so help to restock the common with Meadow Pipits.

This being the only nest we believed to be available for the use of the Cuckoo, I was much exercised as to what she would do. I had not yet learned that if the Cuckoo had intended to victimise No. 5 pair to-day, the fact of the bird having deserted since yesterday would be of no consequence seeing that the Cuckoo decides days in advance

where she will place her eggs. Consequently at 3.45 I was more than delighted to see the female Cuckoo float across the common, dip down momentarily to the site of the nest, and fly on to a wild cherry tree (B) in the centre orchard. Almost immediately she launched herself out of the tree, gliding down in aeroplane fashion to settle beside the nest. All this while, young Simmonds had been lying only seventy yards away from the nest on one side, with C. F. Bristol but forty-five yards distant on the other. Thus the Cuckoo had floated down between them as they lay absolutely unconcealed on the open common.

As soon as I saw her alight and remain on the ground I came across under cover of a ridge, crept up alongside C. F. Bristol and lay on the ground waiting until 3.55, when the Cuckoo leisurely flew up into a cherry tree (H) and after preening herself for a few minutes, flew off to join the other Cuckoos, uttering her familiar "bubbling" note (which, by the way, is very frequently given immediately after the act of laying). When she rose from the nest she clearly had no egg in her beak, and as one was missing it is fair to conclude that she ate it at the nest. The Meadow Pipits were not seen at the nest to-day except to hover

above it whilst the Cuckoo was laying. The question as to the removal of one of their four eggs between noon on June 5 and 10 a.m. on June 6 is fully dealt with in an ensuing chapter. Suffice it to say here that this egg was taken away either by the Cuckoo or by one of the Meadow Pipits themselves. From later notes it will be seen that on both the subsequent occasions when this particular pair of fosterers was revisited at its repeat nests by the Cuckoo, the nest was deserted after having an egg removed in circumstances which at least in one case point to the removal being the act of the harassed fosterer.

At 3 p.m. an occupant of one of the neighbouring cottages had come to report the finding by his little boy of a Wryneck's * nest with ten eggs. On leaving us they stumbled upon the new nest of No. 6 pair which already contained one egg, although the previous nest had only been taken four days ago—about the quickest restart that has as yet come within my experience. A suitable reward was promptly offered for the nest to be left undisturbed, because it was even then apparent that this might be the only nest available for the Cuckoo's fourteenth egg due to be laid two days hence.

* *Iynx torquilla*, L.

The Laying of the Fourteenth Egg, June 8.

The third nest of No. 6 pair, which was the only one available to-day, had still only one egg at 9.30 a.m. on the 7th. This morning it had two, not three as there ordinarily should have been. And yet it is extremely unlikely that an egg had been removed, as the fosterer ultimately laid a full clutch of five. Meadow Pipit "sixes" are unknown in this district, and indeed extremely rare anywhere in England.

A party of four, we reached the common at 1 p.m. The Cuckoo—soon in evidence—was distinguished from her mates by her silence except when "bubbling." From the attention paid to her by the No. 6 Pipits it was evident that they expected favours from the Cuckoo.

From about 3 p.m. onwards the Cuckoo, after having spent a certain amount of time watching the male Pipit of No. 8 pair (which pair, by the way, acted as fosterers four days later), showed evident intentions of fulfilling our expectations of the victimisation of No. 6 pair. Twice she flew to a large divided pear tree (G) in an orchard on the east side of the common, hopping up to her invariable perch whence she could command a view of the nest, just as she had done when watching on

May 29 the former nest, 6², of the same pair, where, on May 31, she laid her tenth egg.

Passers-by disturbed her at 4 p.m., when it was evident that she was anxious to lay. She flew across, right over my head, to the centre orchard, accompanied by two male Cuckoos, all three afterwards wheeling over to the north end of the common. Unaccompanied she then flew to an isolated oak tree (F) which borders the area on the south-east side, but owing to the thickness of the foliage it was impossible to see her.

Between 4.30 and 4.45 the Cuckoo made four floating glides down to the nest, scarcely alighting and immediately returning to the same tree. But on the last occasion she stayed at the nest for rather over a minute, and during the whole of this time I could clearly see one of the Pipits, although both were at the nest, fluttering and tumbling around the gorse near the Cuckoo, which was mainly concealed by the herbage. The male Pipit had been in constant attendance on her during the preceding half-hour, accompanying her backwards and forwards on her flights to the nest.

In a little more than sixty seconds the Cuckoo had laid her egg. As she left the nest and flew across to the "east orchard" I got a perfect view

of an egg between her mandibles. So short had been her stay at the nest that I yet feared that this egg she was so carrying might be her own, and so I did not hurry to the nest. But five minutes later all of us had assembled there and found it to contain the Cuckoo's fourteenth egg and one only of the Pipit's, the former being still quite warm.

The Laying of the Fifteenth Egg, June 10.

Owing to the presumed rapid massacre of the Meadow Pipits by the Kestrel, we did not know of any nest available for the Cuckoo to-day. Nor in fact, as after events proved, was there a Meadow Pipit's nest with egg or eggs on the common.

Anticipating the difficulty in these circumstances of getting in sufficiently close touch with the Cuckoo to ascertain definitely what she would do, I had asked my friend, P. B. Smyth of Wanstead, to come down specially for the day's operations.

At 1.30 p.m. Smyth, the two Simmondses, and I took up positions so that between us we controlled a fairly good view of the whole area. At 12.45 we had seen the Cuckoo, attended by No. 6 pair of Meadow Pipits, sitting in a cherry tree (A) in the centre orchard. A little later she had flown right

away. At 2 p.m. her bubbling note was heard from the orchard to which she had returned unobserved. A few minutes later Smyth and I saw her fly thence to an ash tree (K¹) behind a cottage at the north-east corner of the common. She alighted for a moment and then flew apparently into the forest. At about 2.30 Smyth caught a glimpse of her slipping back round the north-west corner into the centre orchard, where from our respective positions we could clearly see her preening herself and being literally buffeted by one of the Meadow Pipits she had victimised on the 8th. She showed an evident disinclination to pay serious attention to that particular fosterer.

At about 3 p.m. she again flew right away, this time over the south-east side of the common. Towards 4 p.m. she returned from a south-westerly direction and was seen by Simmonds, senr., to fly into the centre orchard, shortly afterwards taking up a position in a cherry tree (D). From here she could only obtain a view of the lower side of the common, which is never used by the Meadow Pipits, but where we had that morning found a Tree Pipit's nest (TP) with five fresh eggs. That was the only occasion on which the Cuckoo was seen to take any interest in that part of the common.

When, shortly afterwards, she flew south-west to an apple tree (D¹) in a field, I sat down at the foot of cherry tree D, whence she had flown, and watched her through my field-glasses. Before five minutes had elapsed she flew back and settled in the tree immediately above my head and not more than ten feet away. She was facing the Tree Pipit's nest, and I was looking up at her from underneath and behind. It seemed a very long ten minutes that she sat there, as I did not dare to move for fear of disturbing her. My discomfort was relieved by the interesting sight of a cock Chaffinch constantly flying up and buffeting her.

At 4.15 she slipped back into the orchard behind her, enabling me to get away and join Simmonds, senr., who was at a distance of about 150 yards south of the cherry tree D. Very soon she returned to this tree and sat motionless, facing us and the Tree Pipit's nest, which lay between and to our left at about seventy-five yards from her. Simmonds went and flushed the sitting Tree Pipit in order that the Cuckoo might, if she should be unaware, be informed of the existence of this nest, as from her behaviour it was clearly evident that she was anxious to lay. She appeared to be more restless than usual and less decided in her intentions.

Then Simmonds went to report the situation to his son and to Smyth, instructing them to keep a sharp look-out on the centre orchard to prevent the Cuckoo slipping away through it unobserved. He then posted himself behind the cherry tree, thus placing the Cuckoo directly between us.

At 5.30 I realised that the Cuckoo would either soon lay or fly off and join her mates, so I beckoned to Simmonds, junr., to join me and whilst keeping my eyes on the spot where the Cuckoo was sitting, sent him to ask Smyth to join me whilst he joined his father. Towards 6 p.m. I took Smyth to within 70 yards of the tree, where he could clearly see the motionless Cuckoo again being buffeted by the cock Chaffinch, whose nest was presumably close at hand, whereas the cock Tree Pipit was singing joyously and constantly alighting in the most unconcerned manner on the tree in which the Cuckoo sat.

Then, at my suggestion, Smyth lay down where he could clearly see the top of the cherry tree D, where the Cuckoo sat, but without raising his head he could not see the ground beneath the tree or the actual spot where the Tree Pipit's nest was situated. Leaving Smyth I went round to the Simmondses. After a time we heard the familiar

“bubble” of the Cuckoo, seemingly from the forest behind Smyth. On rejoining him at 6.30 he said that he had not seen her leave the cherry tree, but he had seen her fly from the adjacent centre orchard practically over his head into the forest where she twice “bubbled”; her flight had resumed the normal, being rapid and less heavy.

I was so disappointed that I even went to the cherry tree and searched the ground beneath to see if the Cuckoo had dropped her egg. A conference was also held to discuss the possibility of finding the egg in some nest in the orchard. Then it occurred to us that we might just as well look at the Tree Pipit's nest. The hen was on and sat up opening her beak at us just like a young Cuckoo. We flushed her and there, to our great relief, was the Cuckoo's fifteenth egg and four of the fosterer's. Smyth frankly admitted that the egg must have been laid between 6 and 6.30 when he was alone on guard, despite the fact that he could not recollect taking his eyes off the spot in the tree where the Cuckoo was sitting. What better evidence could there be of the necessity for ceaseless concentration when watching a Cuckoo about to lay her egg?

The Laying of the Sixteenth Egg, June 12.

Again no nest was known to be available, and the acute shortage of fosterers looked like preventing this prolific Cuckoo from establishing the record series of eggs. On this occasion the watchers consisted of O. R. Owen, P. B. Smyth, the two Simmondses, and myself, so we were sufficiently numerous to keep the common fairly well under view.

The first item of interest was that the Cuckoo was observed to settle for a short while in a cherry tree (K) which is in a cottage garden on the north-east side. From that tree she could observe the movements of No. 1 pair of Meadow Pipits and the solitary male of No. 4 pair. She was probably locating the fifth nest of No. 1 pair to which she was seen to fly three days later, and which she used six days from now. At this date we had definitely identified as having so far escaped the Kestrel's clutches Nos. 5 and 6 pairs of Meadow Pipits, and we were hopeful of Nos. 1 and 8.

About 2.10 the Cuckoo came from a south-west direction and perched in the top boughs of the tallest tree (C), a pear, in the centre orchard, being thus observed by Smyth. She sat so silent and still that by 2.30 he felt convinced that she intended

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to deposit her egg on that side, *i.e.* the south-west. Consequently, at 2.45 we all five from different points concentrated upon the Cuckoo and the particular pear tree, experience having at last taught us that once she had settled down to a motionless state it was for the definite purpose of victimising then or later some intended fosterer. Only a Linnet's nest with four eggs was known of in sight of the Cuckoo, though it was thought to be just possible that No. 8 pair of Meadow Pipits had a nest with an egg or two, since they had escaped any very definite observation on our part.

The Cuckoo remained motionless in the top of the pear tree (C) for nearly $2\frac{1}{2}$ hours. Just after 4.30 she floated out of the tree, glided down to a point about forty yards distant, and returned immediately without alighting. No. 8 pair of Pipits accompanied her and, with other birds, also followed her in a restless flight from the pear tree through the orchard and once or twice round the trees again.

Within five minutes of her original flight she once again floated from the pear tree down to the same spot as before. She was again accompanied by the Meadow Pipits and, alighting for not more than thirty seconds, she laid her sixteenth egg in

nest 8². She then returned to the centre orchard, but not to the pear tree. A few moments later she uttered the familiar "bubble," to which a male responded promptly by "cuckoo"-ing, as on some previous occasions immediately after the egg had been deposited. Owen, whose viewpoint was perhaps the best, noticed that prior to the original glide a Pipit had led the way by flying down to the spot where we subsequently found the nest containing the Cuckoo's egg and one of the fosterer's. Later events proved this to be the only Meadow Pipit's nest then available, though there were some of Skylarks and Tree Pipits in suitable state had the Cuckoo been disposed to make use of them.

On the next day, June 13, whilst P. B. Smyth was approaching the common from the south-east side about 2.10 p.m. he saw a female Cuckoo flying away and heard her "bubbling" during flight. At 2.25 a female Cuckoo was in the centre orchard but remained for only five minutes before she flew, accompanied by a small bird, into the forest on the south side. She remained there for two or three minutes and then flew round the edge of the common into a tall ash tree (K¹) at the north-east corner, which commanded a perfect view of No. 1

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pair, whose nest was victimised five days later. She remained in the ash for half an hour, returning to the centre orchard just after 3 p.m. Between that time and 5.30 p.m. she made occasional short flights into the forest, always coming back after a short interval into the favourite centre orchard, into which she was more than once chased by a male Cuckoo.

It had been observed that, during the afternoons on which the Cuckoo laid, the male birds seldom molested her, although often perching in, and "cuckoo"-ing from, neighbouring and adjoining trees to the one in which she was sitting.

On June 14, at 11.30 a.m., an entirely different Cuckoo's egg was found in the nest of No. 8 pair victimised two days previously on the occasion of the laying of the sixteenth egg by Cuckoo A. Comment upon this interesting point is made in Chapter XII, p. 187, under Cuckoo F.

Both at 2.30 and 3.10 p.m. the bubbling note of a female Cuckoo was heard from the north-east direction, and at 4 p.m. she flew across the common just prior to a tremendous thunderstorm which lasted until 5.30 p.m. As nothing further was seen or heard of her the watch was abandoned at 6.30, it being decided that Cuckoo A had not laid

(at least not on the common) her seventeenth egg to-day as we had anticipated. There was a nest available, as we proved by finding one with two eggs of No. 1 pair on the morrow.

On June 15 Simmonds, junr., arrived on the common at 12.30. At 1.50 he heard the Cuckoo "bubble" in the ash tree K¹, and lay up to observe her. At 3 p.m. she floated down for about five seconds to what subsequently was found to be the site of the fifth nest of No. 1 pair of Meadow Pipits. She returned momentarily to the ash, and then flying three times round an oak (L) near by, betook herself to the centre orchard and thence away without a sound. At 4.20 young Simmonds went home, but returned with his father from 7 p.m. until 8 p.m., finding the nest (1⁵) with two eggs of No. 1 pair. This nest was therefore available yesterday for the due deposition of Cuckoo A's seventeenth egg, had it been laid, and it will be recollected that she had been seen making observations there on June 12 and 13.

The Taking of the Seventeenth Egg, June 16.

At 1.5 p.m. the female Cuckoo flew across the common into the centre orchard and remained there for a short while; on leaving it she was

joined by a male Cuckoo. She "bubbled" from the centre orchard at 2 p.m. and immediately flew across to the north-east side of the common to return with a male Cuckoo. Settling down to preen herself she was continually buffeted by the male Meadow Pipit of No. 6 pair.

At 2.20 p.m. she slipped into the cherry tree A, and sat motionless, as though to lay, until 3.40. Then she floated down to the ground, showing the observers the fourth nest with one egg of No. 6 pair. For the third time out of four this fosterer's nest was built under a mound. Chased by her intended dupes the Cuckoo immediately glided on into some trees behind the cottage garden on the north-east side where she was lost to view. Having seen nothing more of her we left for tea at 4.30. Returning at 5.30 I watched a Pipit behaving suspiciously in the territory of the missing No. 9 pair. This subsequently proved to be No. 8 pair at work building its third nest.

I heard the "bubble" of the female Cuckoo over on the north-east, and about a minute later saw an obvious male and female flying towards me from that direction. They passed over, she "bubbling," going south-west into the forest. I thought that an egg had been laid in nest 1⁵,

found by Simmonds, junr., yesterday, which a few hours ago had been seen to contain three eggs. So I went to look at this nest but found it undisturbed. Whilst standing by it at 5.45 I happened to catch sight of a Cuckoo flying up from the spot (5⁴) where at 1 p.m. we had found with one egg the fourth nest of No. 5 pair. Promptly I put my glasses on the Cuckoo as she settled in a tree beside cherry tree (H), and felt convinced that I saw an egg in her beak.

After flying into another tree near by she flew across "bubbling" into the centre orchard and was there joined by a male. Then we went to the nest 5⁴ and found her seventeenth egg left in exchange for that of the fosterer.

This being the due day and time for the eighteenth egg, I then thought that after all she must have laid on the 14th, possibly during the thunderstorm, which prevented the party doing any really effective watching after 4 p.m. Consequently for day after day we scoured every inch of the common and its vicinity in the hope of finding this presumed missing egg. So minute was our search that it is extremely unlikely that any nest of any species could have been overlooked on the common. Later I was to learn that it is quite a

usual thing for Cuckoos to have one or more breaks in their laying sequence, but at the time I had become so accustomed to the regular laying of Cuckoo A that I could scarcely credit a lapse—and that for a regular laying interval—in her activities.

The Laying of the Eighteenth Egg, June 18.

In the morning we observed No. 8 pair of Meadow Pipits—restarted on the 13th inst.—behaving suspiciously as though they had built a new nest. We examined nests 1⁵ and 6⁴ which contained five and three eggs respectively, and at noon saw the Cuckoo, which appeared to be watching Tree Pipits on the extreme south-west corner of the common. There was a Tree Pipit's nest there, the new nest of the pair she had used for her fifteenth egg, but it was ignored by the Cuckoo. Thence she flew to the centre orchard.

At 1 p.m. I saw her quietly watching No. 6 pair of Meadow Pipits from the cherry tree B, in the centre orchard. I purposely frightened her away and lunched within twenty yards of nest 6⁴, as I thought it more desirable that she should use nest 1⁵ to-day, since it contained its full complement of eggs and, owing to its location, was more liable to accident.

At 3 p.m. I walked over to see if there were any sign of the Cuckoo at nest 1⁵. I saw no sign of her, but flushed the pipit from her five eggs. Looking back, after I had walked away for some 250 yards, I noticed the Cuckoo circling round the nest and the pipit with her. Through my glasses I saw her circle three times and then alight. We approached to within 150 yards and watched across the dip between, but having seen nothing by 3.20 and hearing faint "bubbling" from the orchard on the north-east corner of the common, I thought I would just look at the nest again though not expecting that the egg had yet been laid. But it was there with the Pipit brooding it with only four eggs of her own. This eighteenth egg was therefore laid at 3.5 p.m., the earliest hitherto observed, and following 5.45 p.m. two days ago. Before this the earliest time noted was 3.10, when the twelfth egg was laid in the fourth nest of this same pair of Meadow Pipits.

*The Finding of the Nineteenth and Twentieth Eggs,
June 22.*

First to glance at the spade-work performed since the 18th. On the 19th I observed No. 8 pair of Meadow Pipits again building, but un-

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fortunately did not find the nest. Perhaps it will be remembered that the previous nest of this pair was used by the Cuckoo for her sixteenth egg on June 12, and on the 14th we had found in it an egg of a strange Cuckoo and another laid by the fosterer in the nest we had left empty the day before.

It was a cheerless wet day on June 20 when, at 11.30 a.m., the Cuckoo settled in an oak tree (E) in the forest. She was then thought to be merely watching No. 8 pair, but, as subsequent events showed, she was doubtless about to lay her nineteenth egg in their nest, which I was not aware was sufficiently advanced. At 1 p.m. we heard the familiar "bubble" in the centre orchard, in all likelihood given after she had laid in nest 8⁴.

Locating the Cuckoo in one of the tall pear trees close to tree B, we took up positions commanding nest 6⁴, for this was the one I expected her to use to-day. Before 1.40 I noticed that the male Meadow Pipit belonging to this nest seemed to expect the Cuckoo's visit as much as I did, for he flew to the Cuckoo in the tree and back to the approximate nest-site—a distance of seventy yards—as many as twelve times. On one occasion he insisted on his mate leaving her nest to accompany him. The whole attitude of this particular pair

throughout the season appeared to be that they welcomed the Cuckoo's attentions as though they were royal favours ; the actions of the male bird in particular were fussy in the extreme.

At 1.45 the Cuckoo was frightened away by a passer-by. She returned at 2.10 and took up a position in the leafy boughs of the cherry tree A ; although she was well concealed her presence could always be detected by the constant visits of the male Pipit. At 2.45 the Cuckoo was again disturbed by a man passing under her tree, for it overhung a footpath, but at 3.10 she returned to the centre orchard and settled down on her usual twig in the same tall pear tree near B, in which she had been sitting at 1 o'clock. Suddenly at 3.50 she " bubbled " and immediately flew rapidly off into the forest, and, although some of us waited on in the rain until after 6 p.m., nothing more of her was either seen or heard.

This was a thoroughly disappointing day ; and more especially so since I had invited my friends, Mr. and Mrs. Knibbs, purposely to see the Cuckoo lay her nineteenth egg. On the next day, the 21st, I visited nest 6⁴ to find that it still contained its five eggs.

On the 22nd I arrived on the scene at 10.40 a.m.

and again went to nest 6⁴. The fosterer was not on but the eggs were quite warm. Approaching the centre orchard I heard a familiar "wah-wahing" above my head and, looking up, saw the Cuckoo flying above the trees attended by one of the Meadow Pipits. I retired without disturbing the proceedings and within five minutes saw the Cuckoo circling and floating 200 feet up and followed by both the Pipits.

I called to Simmonds, who had just come on to the common, and as we met, the Cuckoo floated down to the site of nest 6⁴ (visited by her on the 16th, and which it was expected she would use on the 20th) and returned to the pear tree near B without settling at the nest.

Before ten minutes had elapsed she again floated down to the nest and I slowly counted thirty before she rose from the ground and returned first for a few moments to the cherry tree B, and then to her favourite pear tree near by. After having watched her there for about a quarter of an hour we went to the nest, confidently expecting to find her egg, although it was not much after 11 a.m. But we found the Pipit sitting more closely than usual and still on her own five eggs, now two days incubated.

Meanwhile Simmonds, junr., had arrived, and he was put to watch the Cuckoo in the pear tree while we set to work to find the nest of No. 8 pair, which had been seen with building material on the 19th. In less than ten minutes Simmonds announced that he had found the nest with two of the fosterer's eggs and the overdue nineteenth egg of the Cuckoo. Without any question the Cuckoo, when taking up her position at 11.30 a.m. on the 20th as though, as we thought, only to watch No. 8 pair, had really intended to lay. And when I heard her "bubbling" in the centre orchard at 1 p.m. when I started to watch her, she had in all probability just returned from depositing her nineteenth egg in this nest scarcely 150 yards away.

To resume with the Cuckoo's actions to-day. At 11.30 she fled from the centre orchard but quickly returned to it as we passed near by to discover if she were already back. On seeing us she slipped away, and we heard her a few minutes later "bubbling" or "laughing" cheerily at the north end of the common. Very soon we saw her slipping back behind us, flying low into the centre orchard. Here, after preening herself briefly in her favourite perch in the pear tree near B, she

soon moved into the cherry tree A, where, though she was well concealed in the foliage, the Pipit found and joined her.

There she remained watching nest 6⁴ until at 12.45 a woman passing under the tree frightened her away. She quickly returned, only again to be disturbed by a youth going past. Towards 1.30 she came back, and upon alighting in the pear tree gave a cheerful "bubble" and soon slipped into cherry tree A. Hence at 2.5 p.m. she floated down to the nest and the Pipits darted up to meet her. For thirty-one minutes she remained at the nest, and from time to time the Pipits could be plainly seen fluttering around her—fighting, as some would describe it.

The Cuckoo flew up slowly from the nest and we could see no egg in her beak as she returned to the orchard. Presumably she ate it during her long stay, for the view we had of her as she flew away was an excellent one. On going to the nest I found her twentieth egg and four of the Pipit's, and whereas the latter were quite cold that of the Cuckoo was still warm.

After this visitation the Cuckoo was noticeably silent, and throughout the day the call note of no male Cuckoo was heard.

The Finding of the Twenty-first Egg, June 28.

A period of five days elapsed between the laying of the twentieth egg on the 22nd and that of the twenty-first and last on the 27th. The observations on the intervening days were as follows :—

On June 24 we arrived on the common at 10.45 a.m. and only occasionally heard the male Cuckoos from their favourite quarter on the south-east side. At 12.50 p.m. Simmonds noticed two Cuckoos slipping into the orchard on the east side of the common and flying thence behind the orchard at the north-east end. Shortly afterwards a male flew across into the centre orchard, and we caught a glimpse of the female sneaking along the hedge on the north-east. We failed to locate her and neither saw nor heard anything again until 3.45 p.m. when Simmonds, junr., caught sight of her gliding down the depression on the common from the north-east direction. After dipping, she was followed by a Pipit to the centre orchard. Shortly afterwards she flew away thence southwards to the forest.

On going to where the Cuckoo had glided the two Simmondses found a Pipit's nest with one egg. The territory belonged to either No. 3 or No. 4 pair

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of Meadow Pipits (both now consisting of widowed males), but it subsequently transpired that No. 5 pair had moved down over a brow to this, for them, new but adjacent site. Nothing more was seen of the Cuckoos up till 7 p.m. when we left the common.

On June 26 I arrived on the scene at 9.15 a.m. At 10.30 the Cuckoo flew from the centre orchard southwards to oak tree E just inside the forest, as though again to watch No. 8 pair. At 10.45 a Jay (*Garrulus glandarius*, L.) caused her to slip momentarily into an adjacent tree, but she was soon back on her former perch. She remained motionless until 12.10 p.m. obviously watching No. 8 pair and then flew back to the centre orchard.

It is worthy of note that although the Cuckoo watched No. 8 pair for $1\frac{1}{2}$ hours on end, yet she did not complete such a long observation in the usual manner of flying down to the nest—which was not quite finished. Nor did she subsequently deposit an egg in this nest, which duly served as the nursery for its proper occupants.

Soon after 12.30 p.m. the Cuckoo flew across into the orchard on the east side of the common and disappeared. At 1 p.m. we took up positions which commanded most of the ground and

particularly guarded the nesting sites of Nos. 1 and 5 pairs of Meadow Pipits, the only ones possible for a victimisation to-day. (No. 1 pair was subsequently found to have ceased nest-building for the season.)

At 2.10 p.m. the Cuckoo came from the north-east to the centre orchard. Here she sat in her favourite perch in the tall pear tree near B for fifteen minutes. Then she flew back across the common and took up the position in cherry tree K, which she would use for the deposition of an egg in nest 5⁵ to which she had floated on the 24th. This nest then had one egg, but although it contained, as it should have done, two eggs yesterday, there were still only two to-day. It appeared as if the Pipits had deserted, very likely through becoming tired of the Cuckoo's attentions. The nest looked deserted.

At 2.40 a cyclist crossed the common, stopping for a few minutes not far from nest 5⁵ to attend to tyre trouble. No sooner had he passed on than the Cuckoo, escorted by the male Pipit, floated right down to the nest where the female Pipit appeared to await her. Rising almost immediately she flew through the centre orchard and on towards the forest. Upon going to the nest we found only the

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two Pipit's eggs and although we waited until 4.30 p.m., nothing more was seen of the Cuckoo. Later in the evening I glanced into the nest when passing by and was surprised to find only one Pipit's egg. How, then, could anything but the Pipit herself have removed that egg since 4.30 p.m.? The Cuckoo had not been seen on the common since that time. From a similar instance (Cuckoo's thirteenth egg, June 6) in connection with a previous nest (5³) of this same pair, I consider it probable that the removal of the egg in each case was effected by the Meadow Pipit herself, presumably resenting the too frequent attentions of the Cuckoo. This nest, 5⁵, had obviously been deserted since the second egg was laid yesterday morning, and was probably only visited to-day by the Meadow Pipits because the Cuckoo was concentrating her attention upon and actually visited it.

Faintly hoping on the 27th that the Cuckoo, after her two visits on the 24th and 26th, might yet deposit her twenty-first egg in the deserted nest 5⁵, we motored to a distant Meadow Pipit nesting area, secured four fresh eggs and transferred them to nest 5⁵, removing its one deserted egg which we were anxious to have in case the Cuckoo should use this nest.

From 1 p.m. until 4.30 we kept guard on the common, anxiously hoping to see something of the Cuckoo. As a matter of fact, a Cuckoo did fly across at 4.35, settled in the orchard on the east side and thence potted along the hedgerow to another orchard, remaining for a quarter of an hour or so. I am not quite certain that this was a female Cuckoo, nor even if it were, that it was our particular bird, since its actions seemed so strange. Throughout the season I had never seen our Cuckoo take any interest in a hedgerow, or perch on railings as this bird did. But perhaps this unusual behaviour was due to the imminence of migration. In any case, this Cuckoo took no interest in that section of the common where nest 5⁵ lay deserted, so when a heavy downpour set in we regarded things as hopeless and went off to tea. Late that evening I had to leave the neighbourhood, but resolved to return and spend one last afternoon watching to see if the Cuckoo put in an appearance.

Thus at 1 p.m. on the 28th I reached the common, went straight to the deserted nest 5⁵ and, to my utmost satisfaction and surprise, found the Cuckoo's twenty-first egg sitting up on its end, on the entrance side of the nest, alongside three of the four Meadow Pipit's eggs which had been

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transferred to this nest yesterday. The nest was sodden with yesterday's rain and all the eggs were wet. As there had not even been a shower to-day it is probable that the Cuckoo laid her egg on the 27th after we had left at 4.30 p.m.

The best evidence that no more eggs were laid by the Cuckoo is that never again, despite several further visits to the common, was any Cuckoo seen or heard. Moreover, as will be seen by referring to the records of the domestic affairs of the Meadow Pipit fosterers, Nos. 6 and 8 pairs, they each subsequently had nests with eggs which were entirely unmolested and duly hatched and reared their young.

CHAPTER VI

THE THIRD SEASON (1920): NOTES

THE usual practice of the Cuckoo prior to laying was to separate herself from the companionship of the male or males which were constantly in attendance and fly into one or other of her favourite observation trees on or surrounding the common. Having taken up the same precise position in any particular tree, she would remain motionless for a length of time ranging from half an hour to two and a half hours. Generally speaking, until one had watched her in the same position for an hour or more, one could not be sure that the pair of Pipits, which on such occasions was always the object of her motionless attention, was the pair to be victimised that day. On the contrary, the Cuckoo would frequently watch, always from a point of vantage, a pair of Pipits, sometimes disclosing the object and result of her observations by finally floating down alongside its nest, before flying off to some other favourite tree where she would sit for another long period, watching another pair of Pipits, until she actually

flew down and laid her egg in the nest of that pair. It will have been seen that our evidence repeatedly shows that the steady watching by the Cuckoo of the fosterer's nest for anything up to $2\frac{1}{2}$ hours on end would appear to be an essential act immediately precedent to the deposition of an egg. This discovery should surely be of much value henceforward, whenever a Cuckoo is observed to sit motionless, with attention apparently concentrated upon some object, for should the observer be desirous of having the satisfaction of witnessing the deposition of her egg, her subsequent behaviour should be carefully watched.

As a rule, it was not until about 1 p.m. that the female Cuckoo avoided the company of the male, or males, in attendance upon her, and until she did so, identification was almost impracticable. Conversely, her deliberate action in avoiding the company of the males for the obvious purpose of concentrating her attention on one or other of the pairs of Meadow Pipits, which often appeared to be at least as interested in her movements as she in theirs, not only proved her to be a female but also gave us the signal to concentrate our attention upon her and to use every endeavour to maintain her under observation.

At times, after a long period of isolated observation, she would suddenly fly away, though as often as not this was obviously due to some one passing within, say, fifty yards or so. On such occasions she would either dart away across the forest out of sight, or make a circuitous flight round the common, only to return to the same perch in the same tree. When she was seriously bent upon watching a particular pair of fosterers, her return would be only a matter of a few minutes or so, but only a practised eye would observe her come back. As the time for the actual laying of her egg approached, her flight became noticeably heavier. And when she was ready to lay, her flight to the nest was in the nature of an aeroplane glide to earth. Such occasional flaps of the wing as she might require to reach the nest were slow and laboured, somewhat resembling the lazy flight of Buzzard or Owl.

With one's Zeiss glasses—I wish there were glasses made in England like them!—focussed on the female Cuckoo sitting motionless in a tree on observation bent, one could at times gather the impression that she had some sort of mesmeric effect upon her intended victims. For one or both of the pair of Meadow Pipits upon which she was

concentrating her attention would grow uneasy, leave the vicinity of the nest and fly right up to her, fuss nervously round her, and often make feeble attempts as though to attack her. Thence they would return to the ground at or near the nest and fly to and fro in a constant state of agitation. In this connection it should, however, be noted that on the single occasion this season when the Cuckoo victimised a pair of Tree Pipits the fosterers appeared to pay supreme disregard to her presence—unfortunately, as will have been seen from the notes made at the time, her actual flight to the nest was not observed on that occasion. Certainly no other fosterer could behave more nervously than the Meadow Pipit, and I incline to the opinion that there is probably no other dupe which so utterly gives itself away to the female Cuckoo.

When the Cuckoo was at the nest one or both of the Meadow Pipit fosterers were usually but not always, in attendance, and by their movements appeared to be greatly agitated. It will be noted that, except on the two occasions when the Cuckoo laid her egg in nests which contained eggs already in process of incubation, her stay at the nest was a matter of seconds only; about eight seconds *on* the nest is all that she requires actually to lay—so we

learnt in 1921. So amazingly quickly is the egg laid that I failed during 1920 to discover that the Cuckoo actually sat on, and laid the egg in, the nest. Is it likely, then, for those who claim to have accidentally witnessed a Cuckoo in the act of laying to be strictly accurate in their impressions? She invariably removed one, and only one, of the fosterer's eggs, no matter whether that was the only fosterer's egg in the nest or one of several. On no occasion, either in this or in the following season, did this Cuckoo lay in a nest where there was not already at least one egg of the fosterer. If this be typical—which in all probability it is—it points to the conclusion that usually when a Cuckoo's egg is found alone in a nest it was not placed there before the dupe had begun to lay but exchanged for one egg already laid. This would, of course, not apply to cases where all eggs have been removed from a nest upon a day on which it was a Cuckoo's intention to lay in that nest; for example, see the preceding notes for June 12 and 13 on pp. 80-83. But I incline to Dr. Rey's opinion that—

“there is an extraordinary individual variation in the biology of the Cuckoo which may become locally fixed through the influence of heredity. Many an unedifying dispute regarding the life

habits of the Cuckoo might have been avoided if many observers had not claimed for their observations, which were excellent in themselves, a too general application, and if they had not desired to see the results of special observations upon individuals extended to the species as a whole."

Although it might not appear so from this season's account, we found a considerable number of Tree Pipits' and Skylarks' nests on the common, and after the ravages wrought by the Kestrel on the Meadow Pipits we endeavoured, so far as possible, to have one or more of these nests always available, lest on one of the Cuckoo's laying days there should not be a Meadow Pipit's nest in suitable condition for her.

Although this Cuckoo A laid in this season of 1920 the record number of twenty-one eggs, one must rid oneself, before passing on to ensuing chapters, of any impression that Cuckoos in general show anywhere near the same degree of prolificity. Had it not been for our engineering of the circumstances it is obvious that Cuckoo A would have had far fewer favourable chances of laying, and in all cases where long series of eggs have been obtained from the same Cuckoo—some of which I

shall mention later—additional opportunities to lay them have been afforded to the Cuckoo by the taking of the Cuckoo's eggs, and some at least of the fosterers', and thus accidentally or otherwise restarting the fosterers.

A short summary of Cuckoo A's record performance is appended. Full details of the laying of each egg have, of course, been given in the preceding chapter.

CUCKOO A'S TWENTY-ONE EGGS IN 1920

Egg:	Date of laying.	Time of laying.	Fosterer.	Nest
A ¹	May 13		Meadow Pipit	4 ²
A ²	" 15		"	1 ²
A ³	" 17		"	6 ¹
A ⁴	" 19		"	9 ²
A ⁵	" 21		"	5 ²
A ⁶	" 23	After 3 p.m.	"	1 ³
A ⁷	" 25	After mid-day	"	3 ²
A ⁸	" 27	Before 5.45 p.m.	"	4 ³
A ⁹	" 29		"	7 ²
A ¹⁰	" 31	Before 3.55 p.m.	"	6 ²
A ¹¹	June 2	4.30 p.m.	"	9 ³
A ¹²	" 4	3.15 p.m.	"	1 ⁴
A ¹³	" 6	3.45 p.m.	"	5 ³
A ¹⁴	" 8	4.45 p.m.	"	6 ³
A ¹⁵	" 10	Between 6 and 6.30 p.m.	Tree Pipit	
A ¹⁶	" 12	4.35 p.m.	Meadow Pipit	8 ²
A ¹⁷	" 16	5.45 p.m.	"	5 ⁴
A ¹⁸	" 18	3.5 p.m.	"	1 ⁵
A ¹⁹	" 20		"	8 ³
A ²⁰	" 22	2.5 p.m.	"	6 ⁴
A ²¹	" 27	After 4.30 p.m.	"	5 ⁵

N.B.—The first four eggs were not found as laid, but by all available evidence I am certain of the correctness of the dates given.

N.B.—The Common is surrounded by forest on three sides, north, west, and south, from a point near tree L round to a point near the 100-yard mark on the scale.

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Cuckoo B

Egg.	Date of laying.	Time of laying.	Fosterer.	Nest.
B ¹	About May 11		Linnet.	<i>See p. 51.</i>

One Egg by Another Cuckoo

Egg.	Date of laying.	Time of laying.	Fosterer.	Nest.
F ²	June 13 or 14		Meadow Pipit	8 ²

See p. 83.

F¹ Found in a Meadow Pipit's nest on June 1 on another common about three miles away, and the nearest Meadow Pipit breeding area in relation to my common.

CHAPTER VII

THE FOURTH SEASON (1921): THE FOSTERERS' HISTORY

IN hopeful anticipation of Cuckoo A's return for the fourth successive season we pursued our last year's policy of paying preliminary visits to the common for the purpose of getting in touch with, and controlling the operations of, the Meadow Pipit fosterers. We found territories Nos. 3, 4, 5, 6, 7, 9 in occupation by Meadow Pipits, but there were no birds on Nos. 1, 2, and 8. It is worthy of note and perhaps not merely coincidence, that season 1921 opened with the same number of pairs of Meadow Pipits on the common as there were male Pipits left at the close of the previous season. There was some slight change in the nesting areas of the various pairs, although they were as easily identifiable as last year, in fact more so owing to the reduced number. I attribute the reduction in the number of pairs to the ravages of fires, started by some of the village boys on the common early in March. Some of the best

breeding-ground was thus ruined for the season. A fatality had overcome No. 3 pair before the Cuckoo began to lay, and so there were only five pairs to serve her requirements. I am not giving the same detailed account as before, as that will have well served to explain our methods. The following is a summary of the domestic history of the Meadow Pipits in residence this year. The territories are shown on the plan at the end of Chapter VIII, p. 150.

No. 3 pair had one nest before the Cuckoo began to lay, and then disappeared. Eventually the cock was found dead on that pair's breeding territory.

No. 4 pair had its first nest too soon for the Cuckoo. Its second nest, built on No. 1 vacant territory, received the Cuckoo's second egg, which was the first occasion on which the Cuckoo was filmed, and the Cuckoo's seventh egg was placed in the third nest of this pair. Then the male deserted his own mate and paired with the female of No. 3 pair. The combined pair had three more nests, the Cuckoo using the first two for her tenth and fifteenth eggs, whilst the third and last duly contained and brought up a brood of four young.

When the female of No. 3 pair mated with

No. 4 male she continued to select the same somewhat unusual type of building site as had distinguished her from the other pairs on the common at the beginning of the season.

This affords an unique illustration of the truth of the theory that whereas the male bird wins for himself the right to territory, yet with the female rests the choice of the precise situation on that territory.

Not so unlike the human order, in this as in many respects !

No. 5 pair first nested before the Cuckoo returned. Its second nest got the Cuckoo's fourth egg, the laying of which was also filmed. The third nest was visited by the Cuckoo and photographed by Miss Turner, but the Cuckoo refused to lay there. The fourth nest was used by the Cuckoo for her fourteenth egg and was also filmed and subsequently held a brood, eggs of other Meadow Pipits substituted for those taken with the Cuckoo's having hatched.

No. 6 pair had five nests, the first before the Cuckoo's arrival. The second received the Cuckoo's first egg ; the third the Cuckoo's sixth egg ; the fourth the Cuckoo's ninth egg ; the fifth the Cuckoo's thirteenth egg, the laying of which was filmed, and the fosterers' then hatched substituted Meadow Pipit's eggs.

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No. 7 pair had four nests. The first three were not used by the Cuckoo although she visited the third nest several times. The fourth she used for her eleventh egg, the act of laying being photographed by Miss E. L. Turner, and the same nest was used by another Cuckoo (almost certainly the E bird of 1919—see p. 32) sixteen days later, the day before the Pipits actually hatched a brood from substituted eggs in this fourth nest.

No. 9 pair had four nests, the first before the Cuckoo returned. The second nest received the Cuckoo's third egg (also filmed); the third the Cuckoo's eighth egg; and the fourth the Cuckoo's twelfth egg. The laying of this egg was excellently filmed. This pair did not build again.

CHAPTER VIII

THE FOURTH SEASON (1921): RECORD OF OBSERVATIONS

WITH the coming of April, preparations for this season's campaign were complete. During the winter I had had constructed half a dozen specially designed "hides" or screens of wicker-work covered with heather, of which the photograph opposite will give a better idea than any description. These were placed early about the common so that the local inhabitants, animals on the common, and the prospective fosterer Meadow Pipits themselves should become accustomed to their appearance, and also that the Cuckoo, should she return, might have the opportunity to become familiar with them before she commenced to lay. Although I had all along an intuition that my favourite Cuckoo would come back for the fourth time, yet I was prepared to be not overwhelmingly disappointed had she failed to do so, since it seemed almost certain that another bird would seize the

THE AUTHOR GETTING INTO ONE OF THE "HIDES."

opportunity to occupy such an eminently desirable territory.

The definite results of last year had given me more than sufficient grounds for hope that this season would see the successful filming of the Cuckoo in the act of laying eggs, so I had entered into a contract with the Commercial and Educational Film Co. whereby the services of an expert operator were to be placed at my disposal at short notice. Let it suffice for the time being to say that most satisfactory film photographs were taken of the laying of the 2nd, 3rd, 4th, 12th, 13th, and 14th eggs and also of two glides preliminary to the laying of the 7th egg.

By the end of April and thenceforwards the work of locating, identifying, and manipulating the nesting arrangements of the various pairs of Meadow Pipit fosterers naturally became most exacting, and forced us to be almost constantly on the common. On April 27 a male Cuckoo was first heard and on the 30th we saw the first evidence of the female. Two Cuckoos were flying together, one chasing or following calling "cuck-oo" and spinning demonstratively round the other as though welcoming her upon her return from the south, as she settled silently at 9.45 a.m. in the ash tree (K¹)

by No. 1 territory. About 11 a.m. I watched for five consecutive minutes a male Cuckoo chasing a female at a great height—several hundred feet—circling over the common and forest. Subsequently upon alighting together he “cuckoo-ed” very softly to the female in the centre orchard. From now onwards, both birds were constantly about, the male paying much attention to the female.

On May 1 at 7.30 a.m. I saw the female Cuckoo carrying a twig or straw about six inches long and being chased by a calling male. This continued for over a minute before she dropped it. Now here was an action of extraordinary interest and one which could lend itself to any amount of speculation on the earlier habits of Cuckoos. The act of picking up nesting material is a common one in the courtship of many species who build nests in the ordinary way.

Shortly afterwards I heard definitely and for the first time a second male Cuckoo, but only one was in really close attendance upon the female, which in certain lights is, to me, readily distinguishable. In the early afternoon of May 7, No. 6 Meadow Pipit, by fussing round her, disclosed to us the presence of a female Cuckoo in the cherry tree G², the tree

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which she would use from which to glide to a nest on No. 6 territory. To anticipate, she used a No. 6 nest five days later for her first egg.

On the morrow I spent much of the afternoon on the common on the off-chance of the Cuckoo contemplating starting to lay, but saw nothing of interest beyond a female Cuckoo being chased by two males.

On May 9 I passed most of the day elsewhere, but was on the common in the late afternoon. Going by the centre orchard I looked back from No. 4 territory and caught sight of a Cuckoo gliding from the orchard in the direction of No. 6 or 7 territory, the undulations of the common obscuring her exact destination. I ran over the brow but saw nothing, so I concluded, and there and then prophesied, that she was visiting No. 7 nest (with two eggs) preparatory to laying either on the 11th, 12th, or 13th, and of these three dates I stated that I fancied the 12th for her first egg. The Cuckoo did in fact lay on the 12th, but in a nest of No. 6 pair.

From 2 p.m. until 5.45 Simmonds and I were on the common on Wednesday, May 11. For most of the time we were looking out for and watching the female Cuckoo. At 3.55 she flew from the east side to the centre orchard and took

up a position in the tall wild cherry tree B. The fact that she occupied the self-same perch as last year convinced me that she was Cuckoo A, although I had all along been almost sure of her identity. For twenty minutes she sat in the same spot, with a Meadow Pipit in close attendance, and, until she slipped away, we really thought that she intended to lay, although she never apparently concentrated on any definite spot and was not in the right position to float to No. 7, the nest anticipated for her first egg. But she *was* in a suitable tree to observe No. 6.

The Laying of the First Egg, May 12.

After breakfast the female Cuckoo was busy "bubbling" in the east orchard containing the trees marked G, with one male in close and a second in more distant attendance. About 12.50 p.m. she flew into the centre orchard "wah-wahing" and followed by Meadow Pipits. After she had been sitting for a quarter of an hour in the tall pear tree (B¹), with Pipits fluttering near, I approached and she flew to the east orchard where I could not find her perch. At 1.20 she returned to the centre orchard and at 1.40 was back in the east orchard with two Meadow Pipits.

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By this time the two Simmondses had arrived, and at 1.40 Simmonds, senr., got into a hide on No. 6 territory. Five minutes later Simmonds, junr., and I went nearer to the east orchard and eventually located the Cuckoo sitting in a pear tree (G^3)—her favourite tree (G) of last year had been felled during the winter. At 2.10 she floated, accompanied by two Pipits. My heart thumped as she almost alighted, before gliding on into the centre orchard, whence, after a momentary stay, she returned to the east orchard, attended now by three Meadow Pipits. Again she floated across to the same spot, just alighting and hopping about, then round and back at 2.20 to the east orchard. For the third time at 2.25 she floated from the pear tree (G^3) in the east orchard, and on this occasion settled for four minutes near the same spot as before, hopping about and being clearly visible through glasses. Rising, she flew to the centre orchard, and thence flapped slowly back to the east orchard; whereupon I went across to hunt where she had alighted, and soon found a Meadow Pipit's nest with four eggs. This was the second nest of No. 6 pair, nearly a hundred yards away from the first.

From 2.30 to 3.45 she sat motionless in the

pear tree in the east orchard, and during this time I moved up another hide within about fifty yards of the nest so that I could get a better view. Twice the Pipits came and perched on the hide, from within which I could plainly hear the patter of their feet on the heather covering, and the flutter of their coming and going.

When any one passed near the east orchard the Cuckoo would withdraw completely from view under the leaves of her perch, so much so that I detected a passer-by through first noticing the Cuckoo withdraw herself. At 3.45 she shattered our hopes by flying off southwards, chuckling. Five minutes later we emerged from our hides.

Suddenly at 4.25 I saw the Cuckoo floating across "wah-wahing," followed by Pipits, and returning to the pear tree in the east orchard. Then we knew that she meant business, and so re-entered our hides without delay. Accompanied by Pipits she floated from her perch at 5.5, but passed the site of the nest and circled through the centre orchard, where she rested for a minute. Then she repeated the performance but this time settled at the nest, and in less than thirty seconds laid her first egg of the season, exchanging it as usual for one of the eggs of the fosterers. Then

she flew into the centre orchard and settled low down in a different tree. (It should be noted that after laying the Cuckoo never returned to her observation posts.) Though the fosterers had so far accompanied her, they now quickly left her, which satisfied me that this time she had laid. On going up to the nest I recognised the egg as identical with the forty-six I had obtained from this Cuckoo in the three previous seasons.

When the Cuckoo was laying the Pipits danced about in the most excited manner, giving me at a distance the impression that this No. 6 pair welcomed the event. And whilst I was watching the Cuckoo and Pipits before the egg-deposition, one of the latter twice appeared with a green grub which it carried and held with apparent intent to give to the Cuckoo. The position of the nest was 150 yards slightly downhill from tree G³, and only 70 yards, rather uphill, from cherry tree A.

The Laying of the Second Egg, May 14.

Now that the Cuckoo had begun to lay, I had telephoned to London yesterday for the kinematograph operator, Mr. E. Hawkins, who duly arrived that evening.

To-day there were two possibilities for the

Cuckoo, either the second nest of No. 4 pair now containing two eggs, or the second nest of No. 7 pair which had been sitting on five eggs for two days.

At 9.30 a.m. we placed a hide within seven yards of No. 7's nest. A second hide we placed later at a similar distance from No. 4's nest. During the morning the Cuckoo was well in evidence, and I soon gathered the impression that she would use No. 4 nest instead of No. 7, which I was anxious for her to victimise to-day. At one time she settled in her favourite perch at the top of the pear tree (C) which she used when depositing her sixteenth egg last year, doubtless to watch No. 9 pair which she victimised two days later.

About 1.10 p.m. I suggested to Hawkins that he should have his lunch and be prepared to enter his hide, which commanded No. 4's nest. Almost immediately I noticed the female Cuckoo (I knew it was the female because, for one reason, she is quite silent when alighting, whereas the males, upon alighting, almost invariably call) fly across the common into the trees (K) at the north-east end which is the natural position for her to take up when she intends to use No. 1 or No. 4 territory. Just before 1.30 I went across to Hawkins to tell

him of the whereabouts of the Cuckoo. Whilst we were talking she appeared overhead, her floating flight definitely indicating that she had designs upon the nest by which we were standing. Hawkins hurried into the hide and in response to his query as to the Cuckoo's whereabouts I told him that she was in the forest on his left to the north. The lens of the camera was directed north-east on the site of the nest, seven yards distant, and Hawkins was hopeful of securing pictures of the Cuckoo alighting, hence his desire to know from which direction she would approach.

Whilst I was assisting Simmonds into another hide not more than 50 yards distant, brought up for the purpose of watching the expected flight, the Cuckoo again made a demonstration overhead, flew round and settled in tree K¹. She had not been there more than a minute when at 1.40 p.m. she began her floating glide towards the nest, a distance of about 90 yards. This took me so much by surprise that it was quite twenty seconds before I got my stop-watch in hand. As pre-arranged with Hawkins I blew a whistle as the Cuckoo began to fly towards him, but unfortunately she did not alight within the area covered by the camera lens. The following is Hawkins' own

description of what he saw from inside the hide.

“ I heard the whistle and saw the Cuckoo alight but did not observe the direction from which she came. The spot on which she alighted was between 3 and 5 yards from the nest. She walked round about as if looking for the nest, and from time to time I lost sight of her behind the short gorse. She walked further away from the nest and to my right and consequently I had to make another peep-hole through the hide to observe her movements. At intervals I turned the handle of the camera to see what notice she would take of the noise, which Mr. Chance and Simmonds had previously stated might wreck the whole performance. To my relief, however, she apparently took no notice of the noise and still continued to search for the nest. . . . All this time the Cuckoo was out of the range of the camera lens, and I was beginning to fear that she would not go to the nest and might fly away again, but eventually she came within the lens, approaching from my right and coming nearer to the hide than she need have done to get to the nest. Not desiring to shift my position I found great difficulty now in following her movements towards the nest, and I was now of course turning the camera handle continuously. She apparently took no heed whatever of this. Apparently recog-

nising where she was, she made towards the nest very quickly and for the whole time that I could observe her went straight up to the nest, sat down upon it, her tail projecting outwards, remained on it for 5-10 seconds, came out again backwards, tail first, turned round and flew off. I was too close up and the rapidity of movement was too quick to see the egg in the beak."

After my stop-watch had registered that the Cuckoo had been on the ground near Hawkins' hide and the nest for over five minutes, I crept up behind the hide in which Simmonds was concealed, to find that he had not heard my whistle, and so was unaware that the Cuckoo had already been for so long near the nest. I stood behind his hide, peeping over the top, and talked to him quietly while he put his glasses on the Cuckoo. From time to time she waddled behind the gorse and consequently out of sight; in between whiles we could clearly see her stumbling about awkwardly over the gorse and looking puzzled and anxious to find the nest. Ultimately we saw that she had found it, and suddenly Simmonds, who had kept his glasses on her more persistently than I (who for the most part was watching her with the naked eye from over the top of the hide), exclaimed that

she had the egg in her beak. As he said so the Cuckoo flew away, and with unaided vision I could see her carrying the egg. Altogether she was on the ground for about $16\frac{1}{2}$ minutes, it being 1.56 p.m. when she left. Her second egg of the season was lying in the nest alongside one egg of the Meadow Pipit where beforehand we had seen two.

The film representation of this laying is very distinct. One can actually time how long the Cuckoo takes to lay the egg, and during the last two seconds the actual moment of extrusion of the egg is accompanied by a visible depression of the tail.

The Laying of the Third Egg, May 16.

I have now given sufficient details of the preliminaries to egg-laying by Cuckoo A for the reader to have become familiar with the usual procedure, and so for the remainder of her 1921 series I shall only enlarge upon those points which show special interest. The practised ornithologist will grasp the large and painstaking amount of observational work we had to do before it became possible to write: "To-day we fancied such and such a Meadow Pipit's nest for the Cuckoo's egg No.

so-and-so." To give the full account of each day's work would be not only redundant but probably wearisome now that the *modus operandi* has been so often explained.

To resume. To-day we expected the Cuckoo to use the second nest of No. 9 pair, and so moved up a hide to within six yards of it for filming purposes. Other hides, for the use of Miss Young and Messrs. Calder and Maudsley, who motored over specially to observe the performance, were placed at distances varying from 30 to 50 yards away. Hawkins fixed up his apparatus in the hope of filming the Cuckoo's glide down to the nest from the pear tree C in the centre orchard in which she was expected to sit prior to laying.

After various manœuvres the Cuckoo sat motionless in the previously indicated perch in the pear tree C, from 1.55 to 3.15, and during this period I joined Hawkins in his hide and remained with him for that day's event. Then she was disturbed more than once and it was not until 4.26 that she glided to the nest, a distance of about 80 yards, alighted by its side, glared at our hide for a few seconds, and then suddenly dived at the nest-hole. Concealed in the "screen" sitting beside Hawkins I was so intently gazing at her every movement as

to be absolutely unaware of the presence of the Meadow Pipits, which Hawkins declared would be reproduced on the film, hopping and dancing about in a most excited manner within one or two feet of the nest. I clearly saw the Cuckoo lay on the nest, and as quickly back out and fly away. She was at the nest side for about twenty seconds in all, inclusive of her hesitation on alighting, and the film reproduction shows the Pipit dashing at the Cuckoo as she lays on the nest, whilst her head holding in the beak the stolen egg is hidden in the grasses at the back of the nest.

The Laying of the Fourth Egg, May 18.

To-day's indications pointed to the second nest of No. 5 pair of Meadow Pipits and we placed two hides near it, that for Hawkins being within seven yards, the other, containing my brother Kenneth, at ten yards' distance. Just before 4.15 the Cuckoo glided from the cherry tree H¹, in the garden orchard on the east side of the common. The length of the glide was only about 50 yards, and from that moment onwards, until about forty-five seconds later, when she flew away with the fosterer's egg in her beak, Hawkins filmed continuously.

The Laying of the Fifth Egg, May 20.

We knew of no Meadow Pipit's nest containing eggs, and in fact there was not one. Accordingly the closest guard was kept over the common so that no movement of the Cuckoo should be missed. The second nest of No. 3 pair of Meadow Pipits ought to have been ready for the Cuckoo to-day, but we had failed to find it, and later in the season we found the cock dead, which was why this pair never had a second nest. The Cuckoo on several occasions sat in the oak tree (L) which she often used last season when observing No. 1 territory. Eventually with a friend I saw her glide from it at 2.50 p.m. Before there was time to advise the rest of the party we saw her disappear in a bank 40 yards from her tree, and in less than thirty seconds she reappeared, and I could clearly see an egg in her beak.

On going up we found a Tree Pipit's nest containing one egg and the fifth egg of the Cuckoo.

The fact that she used the nest of a Tree Pipit confirmed our view that there was no Meadow Pipit's nest with eggs, which was subsequently definitely proved to be the case.

My friend, T. W. Helme of Lancaster, witnessed with me from 50 yards' distance to-day's event, the

location of which was not, of course, in this instance forecasted.

The Laying of the Sixth Egg, May 24.

We had expected the Cuckoo to lay this egg on the 22nd, although we were then still unaware of an available nest. Yet subsequent events showed that there was one, the third of No. 6 pair of Meadow Pipits, which then contained two eggs. There were, moreover, at least two Tree Pipits' nests in suitable condition of which she did not make use. For that matter it is probable that no Cuckoo will lay in nests other than those of her natural fosterers unless under certain conditions, which are discussed in Chapter XI.

Our party to-day consisted of O. R. Owen, Hawkins, P. B. Smyth, the two Simmondses, Mr. and Mrs. C. E. Baker, Mr. and Mrs. C. H. Roper, Miss E. L. Turner, and myself. We thought at first that the Cuckoo might use the third nest of No. 7 pair, which now had two eggs. Although we did not feel confident, we placed in position hides for Miss Turner and Hawkins. But at 1.45 I saw a Pipit, with a green grub in its beak, fly from No. 6 territory up into the Cuckoo's observation tree (H¹). This reminded me of the attitude of the same pair

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when the Cuckoo laid her first egg, and as I walked up to the tree the Cuckoo suddenly bustled out. From then onwards she showed unusual determination to return quickly to the tree. So we drew around her, now knowing that she intended to victimise No. 6 pair. But unfortunately we could not find the nest, although the Pipits did their best to show it both to us and the Cuckoo! At 5.5 p.m. she floated across the common, passed on to the centre orchard and then paid a momentary visit to the site of No. 7³; Miss Turner, still in her hide, actually saw the shadow of the Cuckoo across her lens.

However, the Cuckoo returned to her former tree, and at 5.10 she dropped down to the nest for a moment. She flew back to a bare bough in the same tree, from which she quickly floated down to the nest which we had been unable to find. She took twenty-eight seconds for the glide plus the stay at the nest, before flying on to the centre orchard. The glide distance was 35 yards and it alone took seven seconds. On going to the nest we found three of the fosterer's eggs and the sixth of the Cuckoo; one of the Pipits continued to carry the grub about in its beak after I had removed all the eggs and restarted the pair.

The Laying of the Seventh Egg, May 26.

According to our arrangements we hoped that the Cuckoo would to-day lay her seventh egg in the third nest of No. 7 pair of Meadow Pipits and her eighth egg on the 28th in the third nest of No. 4 pair. But it will be seen that our anticipations were not quite accurate.

We fixed up the hides near No. 7 nest : Hawkins' at a distance of 10 yards from the nest, so that it lay directly between him and the tree in the centre orchard from which the Cuckoo would probably glide ; Miss Turner's at right angles at a distance of 5-6 yards. Shortly after 12 o'clock the two photographers entered their respective hides. Meanwhile the Cuckoo took up her post in the expected tall tree B. Unaware of this, at 1.30 I flushed her from this tree ; but she soon returned and thereafter sat motionless looking towards No. 7's nest until at 2.10 she floated down, alighted near the nest, but immediately rose and flapped heavily away like an owl, and several small birds, including some swallows, circled excitedly around her. Hawkins cinematographed the Cuckoo on this glide successfully.

Almost immediately the Cuckoo returned with laboured flight to her tree in the centre orchard.

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At 2.15 she again glided down to the nest, and this time remained on the ground for eighteen seconds; but although she looked at the nest she did not lay. She returned to the centre orchard, thence floated in leisurely fashion round behind another orchard overlooking No. 4 nest.

Eventually I thought I would inspect No. 4 nest which had three eggs this morning. On reaching it I was astonished to find the Cuckoo's seventh egg, quite warm and evidently just laid, poised on its large end lying, as always, nearest the entrance to the nest. The eggs, of course, are frequently twisted about by the foster birds, so there is nothing of interest in the position of the eggs in the nest unless one sees the eggs as left by the Cuckoo and before the foster bird has returned.

One wonders if the Cuckoo would have laid in No. 7's nest but for the hides! Why did she twice visit this nest and then lay quickly without posing before No. 4 nest?

Amongst to-day's visitors was my friend George B. Hill of Bewdley.

The Laying of the Eighth Egg, May 28.

This was a most interesting day, inasmuch as the Cuckoo led us a rare dance, or perhaps it would

be more correct to say that we led her one. The third nest of No. 9 pair was the one we expected the Cuckoo to use to-day, so we placed Miss Turner's hide within 3 yards of it—Hawkins having now left us for a few days to develop and report upon the film so far exposed. The nest of No. 7 pair was still available, but as the Cuckoo had already paid it two abortive visits, prior to laying her last two eggs, we regarded it with little or no confidence. As we discovered later in the day, there was also a nest with two eggs of No. 5 pair.

Our party consisted of H. Massey (who had travelled specially from Manchester despite the coal strike!), O. R. Owen, the two Simmondses, Miss Turner, Miss Young, and myself. At 12.5 the Cuckoo sat in her favourite cherry tree (B) in the centre orchard in such a position that she faced No. 5 territory, had her back to No. 9, and was sideways on to No. 7. At 12.55 I purposely placed myself on No. 5 territory in the direct line of her vision, expecting to learn something thereby. Two minutes later she flew, followed by a Pipit, over my head into the orchard behind me and settled in the cherry tree H' she so often uses prior to laying on No. 5 and No. 6 territories. At 1.5, followed by the Pipit, she flew straight towards

me, settled on the common barely 30 yards in front of me, only to rise at once and fly on to the centre orchard, "bubbling" as she went, and then away south right into the forest.

I immediately went to the spot where she had momentarily alighted and found the nest of No. 5 pair, which already contained two eggs although it was restarted but a week ago. Obviously the Cuckoo had moved her position ten minutes ago, intending to fly down to this nest, and desiring to avoid floating right over me.

We now took up fresh positions so as to include No. 5's nest in our operations. At 2.5 I found the Cuckoo settled in the top boughs of her favourite oak tree (E) in the forest, and from Simmonds' report as to where he had seen her flying at 1.5 it was evident that she had been sitting there since that time. Thereupon we knew that she had been having only a passing glance at No. 5's nest and consequently we all concentrated upon nest 9³.

At 2.54 the Cuckoo, accompanied by No. 9 pair of Pipits, floated from the oak tree E, and alighted close to their nest. She evidently did not like the hide, which was much closer to the nest than usual, and floated off to pear tree C. Shortly afterwards she glided back to the site of the nest

and again alighted, but obviously dissatisfied she passed on to the oak tree E in the forest. The nest was situated about 100 yards from tree C, and 130 yards from tree E. From this time onwards her attitude showed timidity, for she made no less than eight attempts to approach the nest and each time was less accurate in her point of alighting.

At 3.20 she seemed to abandon the idea of laying in nest 9³ and settled in the cherry tree B in the centre orchard, from which she quickly made a floating glide to the third nest of No. 7 pair, remaining there a few moments. I went up to the nest and found one of the Pipit's eggs missing, but I was not surprised for, after her return to the orchard, I saw the Cuckoo settle low in tree A and peck at something.

Thereafter she began to make attacks on the nest of No. 5 pair, but the hide, which we had moved up to within 10 yards of it after she had shown me the nest at 1 p.m., apparently upset her bearings. At any rate she could not find the nest, but floated about and settled aimlessly, looking in vain for her quarry. Despite our attempts to drive her back to the centre orchard to encourage her to go to the nest of No. 7 pair, it was some time

before she would desist from her attempts to find No. 5's nest. A little later, evidently by now much harassed by our constant attendance upon her wherever she went, she floated down on to the territory of No. 6 pair and hopped about obviously in search of a nest; and it is striking proof of the truth of my claim that the Cuckoo finds the nests of her dupes when building, that she settled on this occasion right alongside the still building fourth nest of No. 6 pair, which we did not find till two days later, when it contained the first egg of its owner.

In the meantime Miss Turner had left her hide and we removed it away, thus leaving the coast clear for the Cuckoo to return to No. 9. Shortly afterwards she came into the pear tree C, in the centre orchard, and just after 4 p.m. made another float to the site of No. 9's nest, alighted practically at its side but only remained a moment before she went up, chased by the Pipits, to her original post, the oak tree (E) in the forest. There she sat motionless until 4.50 when she again made a flight to the nest, but missed her mark and passed on to the centre orchard pear tree C. To and fro, she made two more attempts; but at 5 p.m. she made the final and successful one, floating down, laying

her egg and removing one of the fosterer's, the time occupied being about forty seconds.

Later, on examining the eggs in No. 7 nest, I found, instead of two eggs out of three I had previously substituted for those of the fosterer, that one of them was undoubtedly the latter's fifth egg. This therefore shows that since the Cuckoo's visit to the nest on the afternoon of the 26th and my visit to it this morning, she had been to the nest again and removed one of the three substituted eggs; but the Pipit had evidently laid her fifth egg on the morning of the 27th, making the number again three. The reason why I had substituted eggs in this nest for those laid by the Pipit was that I did not want the Cuckoo to take one from what was rather a well-marked set. This particular clutch of Meadow Pipit's eggs is in my collection.

The Laying of the Ninth Egg, May 30.

The nest we believed destined for the Cuckoo to-day was the third of No. 5 pair which now had four eggs. But during the morning Owen found the fourth nest of No. 6 pair already completed and containing one egg. This was unexpectedly quick work, as this pair had only been restarted on the 24th after the Cuckoo had used the nest that afternoon.

CUCKOO "A" APPROACHING NEST TO LAY.

(Miss E. L. Turner's photographs.)

This, of course, created an uncertainty as to which pair the Cuckoo would victimise to-day, and at the same time it explained the Cuckoo's harassed visit thereabouts two days ago. We placed Miss Turner's hide opposite to nest 5³.

At 1 p.m. the Cuckoo, sitting in tree H¹, was gazing towards the nest of No. 6 pair, and was still doing so at 1.30 when Simmonds and I sat down by it in the hope of discouraging her and forcing her to No. 5, for it is obviously a disadvantage, with a shortage of nests, to have the Cuckoo laying in a nest containing only one egg and ignoring a nest which already contained four.

Things seemed to be going the way we wanted when at 2.1 p.m. the Cuckoo glided from her tree and settled beside the nest of No. 5. She was on the ground for sixty seconds. Miss Turner obtained two photographs (p. 136) and would have taken a third but for the fact that when the Cuckoo was just entering the nest the Pipit, brooding her eggs, buzzed out in such a way as to startle the Cuckoo, a trick this particular Pipit was rather fond of! She returned to her tree, and at 2.5 again floated to the nest, but the Pipit darted up at her, and the Cuckoo returned whence she came.

Then she transferred her attentions to No. 6

pair, Simmonds and I being close to the nest. To our dismay the Cuckoo at 3.18 floated straight for us but when within twenty yards suddenly swerved away. At 3.20 she flew over the site of No. 5 nest but made no attempt to settle. So I felt that the only hope of getting the Cuckoo to use that nest was to remove the hide and leave the ground quite open to her; but it was of no avail.

At 3.27 the Cuckoo made another attempt at No. 6 nest, but Simmonds frightened her away. This happened twice more before 3.40, and then until 4.7 she sat in the centre orchard and again made a flight direct for Simmonds and myself, gliding off as she neared us. She repeated this at 4.9. In the next seven minutes she made three further attempts to alight near where we were standing. From 4.19 to 4.25 she made five more efforts. Between 4.25 and 5.20 the Cuckoo made no less than eighteen glides for Simmonds and myself, showing thereby the most wonderful determination to lay her egg in the nest of No. 6 pair, which pair had already served as fosterers for her first and sixth eggs.

At about 5.10 a male Cuckoo suddenly put in an appearance and joined the female in the centre orchard, but she resented any attention from him.

It appears, from observations made elsewhere, that if the female is delayed in the laying of her egg a male often arrives on the scene and tries to take a part in the matter. But in ordinary circumstances I should not expect this.

At 5.20 I decided to give up the struggle with the Cuckoo and exchanged the single egg of the intended fosterer for a substitute which the Cuckoo could take away, so that I should be able to take the Cuckoo's egg, restart the pair and yet have the only egg of that fosterer.

Immediately we had removed ourselves to a distance of some thirty yards the Cuckoo flew down and settled within a few yards of the nest, a distance of 110 yards from the tree H¹, and 100 yards from the centre orchard. As she was looking around, some sheep wandered in single file along a track close to the nest. She fluttered aside to allow the sheep to pass, and then resumed her search for the nest. She peered here and there, and as soon as she saw the nest, which was well hidden in the gorse, she dived inside, and within eight seconds had backed out and was away with the substituted egg in her beak. Altogether she was on the ground about six minutes, and the egg was laid about 5.25 p.m.

One can only surmise as to why the Cuckoo should have apparently intended first, at 2 p.m., to lay in No. 5 nest, and then, even when the hide, which was not nearer than ten yards, was removed, take no further interest in that nest but display such remarkable determination to use No. 6 nest in spite of our efforts to discourage her. Possibly she preferred No. 6 pair for the reason that they never seemed to battle with her in the violent manner of certain other pairs, especially Nos. 5 and 9.

The Laying of the Tenth Egg, June 1.

We began the day knowing only of the nest of No. 5 pair, which it was now not expected that the Cuckoo would use; but at 2.35, after sitting motionless for over two hours on tree K¹, she flew down to and showed us a nest with one egg which we subsequently discovered belonged to the cock Meadow Pipit of No. 4 pair and the hen of No. 3 pair, whose mate had died. No. 4 cock had deserted his original hen and thus formed this new combined pair. The nest was situated eighty-five yards from tree K¹. For the fosterer's single egg I substituted another, and after temporary absence from the common, possibly to feed, the Cuckoo

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returned and sitting in tree K¹ for only a few minutes flew to the nest side at 4.15, remained for nearly forty seconds, and laid her tenth egg, removing the substituted Meadow Pipit's. Helping in our observations to-day were P. B. Smyth and O. R. Owen.

The Laying of the Eleventh Egg, June 5.

To-day our party consisted of Mr. and Mrs. H. F. Witherby, Miss Turner, Mr. and Mrs. Philip Gell, O. R. Owen of Knighton, C. H. Roper, the two Simmondses, and myself.

It will be noticed that a second break in the Cuckoo's regular laying occurred on the 3rd. On that day the common had been most carefully guarded throughout the day at every point, since we then knew of no available nest, though in point of fact the fourth nest of No. 7 pair must have had one egg. This nest when found yesterday at 7.30 a.m. contained only one egg, but on looking at it again this morning about 10 a.m. it held three. This clearly proves that the second egg was laid after 7.30 a.m. yesterday, and that the nest must have had one egg on the 3rd and so been in suitable condition for the Cuckoo.

The fourth nest of No. 9 pair had two eggs

to-day, but as time wore on we had the usual reasons for believing that the Cuckoo intended to use No. 7 nest. At 5.14 she floated to it from tree F, a distance of eighty yards, alighting beside it and within six feet of the hide containing Miss Turner and H. F. Witherby. She remained on the ground not longer than ten seconds, and then, according to Witherby, flew away for no apparent cause. However, at 5.18 she again floated from her tree, the glide occupying about ten seconds out of the thirty-one which passed before she rose and flew away with the fosterer's egg in her beak. Witherby states that upon alighting she looked round her for a few moments and then slipped on to the nest, buried almost out of sight, where she remained not more than seven seconds, backing out as usual. Miss Turner photographed the Cuckoo as she left the nest with one of the fosterer's eggs in her beak.

Sixteen days later, a day before the substituted eggs hatched, another Cuckoo came and took one of the eggs and laid her own—the only stranger Cuckoo's egg laid on the common this year! From the appearance of the egg I feel confident that it was Cuckoo E of 1919 (see p. 32), a wandering Cuckoo without a territory of her own.

The Laying of the Twelfth Egg, June 7.

Again we were a large party: H. Tangye and his friend Mr. Johnson, G. B. Hill, C. F. Bristol of Edgbaston, P. B. Smyth, the two Simmondses, Hawkins, and myself being assembled to see the Cuckoo lay her twelfth egg. The whole of this party is shown in the film surrounding the nest after the Cuckoo's egg had been laid.

Our calculations showed that she would to-day use the fourth nest of No. 9 pair of Meadow Pipits, so early in the morning we placed one hide for the use of Hawkins and his cinematograph apparatus about eight yards from the nest, and two more hides at about thirty yards' distance for the use of our visitors.

During the earlier part of the day the Cuckoo performed much the usual kind of evolutions that I have now so often described in detail, and incidentally showed us the site of the fourth nest of No. 5 pair containing one egg, which she used four days later for her fourteenth egg. It is interesting to note that on May 28 she similarly showed us the previous nest of No. 5 pair, immediately before laying in the previous nest of this No. 9 pair.

At 3.25 p.m. she made her first serious attempt to reach to-day's expected nest, *i.e.* No. 9, but on

this and many subsequent occasions she either sheered off suddenly or else flew away quickly after alighting. It appeared as though she were frightened by the lens of the camera, which was perhaps more obvious than usual owing to the rays of the sun shining almost directly on it; but months later, by closely watching the film, we learned that it was the female Pipit buzzing out from the nest on the approach of the Cuckoo that was the cause of her fright. Before 3.32 she made two more attempts, and continued to glide, sometimes alighting, and once actually remained on the ground for the best part of a minute. This visit to the site of the nest is included in the film, which shows the Cuckoo hopping about and being violently attacked by a Meadow Pipit. Just as the Cuckoo approaches the nest, the female Pipit is seen to fly out from the nest with such alarming suddenness as to frighten away the Cuckoo for a time. After about a dozen attempts in all she finally glided down, at 3.50 p.m., from the usual oak (E) in the forest, a distance of 110 yards, and, remaining on the ground for $31\frac{1}{2}$ seconds, with both Pipits on this occasion in attendance, laid her egg, the whole process being filmed by Hawkins at a distance of about eight yards, using his special lens. (*See* photographs, pp. 144, 145.)

CUCKOO "A" AND MEADOW PIPITS LEAVING NEST

I

3

The Pipit's egg in the Cuckoo's bill is most clearly seen in 2 and 3,
16 to a second, representing move-

AFTER THE LAYING OF THE 12TH EGG, 1921.

2

4

and the fluttering Pipits in 3. Four consecutive Film Pictures, taken
ment during a quarter of a second.

[Between pp. 144, 145.]

The Laying of the Thirteenth Egg, June 9.

We began the day not knowing of a nest in suitable condition for the Cuckoo, despite a special 5 a.m. rise to search on the part of five of us, for we knew the nest must be ready somewhere, so we had to guard the common very closely in order that she should find it for us. This she duly did at 1.6 p.m., when she floated to the fifth nest of No. 6 pair which contained three eggs. We rushed up the hides, placing Hawkins in one at eight yards from the nest, whilst Simmonds and I occupied another about twelve yards off. As we were getting ready the Cuckoo made repeated attempts to come down. No sooner were the hides occupied than at 1.15 down came the Cuckoo on a fifty yards' glide from tree G², straight to the exact spot, looked up at Hawkins whilst the camera was working, popped into the nest, took out an egg, laid, and was away again with the fosterer's egg in twenty-five seconds, which included the glide from the tree and the hesitation outside the nest.

To-day's visitors included the Rev. Allan Ellison, of Tenbury.

The Laying of the Fourteenth Egg, June 11.

The nest expected to receive the Cuckoo's fourteenth egg was the fourth of No. 5 pair which this morning contained five eggs and had been found last night by Simmonds in readiness for to-day. We placed Hawkins' hide within three to four yards, as it was difficult to get a good view of the nest at any greater distance; a second hide was placed alongside the first and even closer to the nest; a third hide was placed at a distance of twelve yards. Such an array of hides right up to the nest side perhaps upset the Cuckoo, particularly as she had to make a much longer glide than usual from tree B to reach the spot. Moreover, a strong side wind harassed her to-day, and her glides, covering a distance of 110 yards, took about twelve seconds each.

At 1.45 she made her first glide, but sheered off as though frightened by the hides. Four times she made attempts, and at the fourth she alighted on the ground, and for six minutes remained hopping about at least fifteen yards from the nest. Flying back to her observation tree, B, she continued to make attempts to approach the nest, and on one occasion did settle practically beside it, and was consequently only some two and a half yards from

CUCKOO "A" AND MEADOW PIPIT LEAVING NEST

I

3

The Pipit's egg which the Cuckoo is carrying away in her bill is
Film Pictures, taken 16 to a second.

AFTER THE LAYING OF THE 14TH EGG, 1921.

2

4

most clearly seen in pictures 3 and 4. Four almost consecutive
Notice Pipit following Cuckoo from nest.

[Between pp. 146, 147.]

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the hide containing my secretary, S. A. Ellerm, and myself. But she was away again in a flash, and became very restless, once circling high in the air like a Hawk.

At length, feeling sorry for the Cuckoo, I had the hides moved further back, the nearest one, with Hawkins inside, being then ten yards away. At 3.50 the Cuckoo glided down and remained on the ground for about six minutes, searching diligently for the nest and being continually buffeted by the male Pipit. When eventually she found the nest, the sitting Pipit buzzed out at her, and Hawkins said that he distinctly heard the impact of Pipit against Cuckoo, the latter flying off chased by the aggressor. Almost immediately the Cuckoo returned and, after hopping around for some three minutes, entered the nest followed by the female Pipit, laid in ten seconds, and backing out flew off with a Pipit's egg in her beak, hotly chased by the Pipit. The film shows the Cuckoo and the female Pipit leaving the nest together, the Pipit remaining inside whilst the Cuckoo laid. (*See* photographs, pp. 146, 147.)

Visitors to-day included Miss M. Young and Mr. and Mrs. G. B. Hill.

The Laying of the Fifteenth and Last Egg, June 13.

This was the only egg of this year's series during the laying of which we were not present. The nest we had in view for its reception to-day was the second of the combined Nos. 3 and 4 pair of Meadow Pipits which yesterday had three eggs, and we knew that this was the last remaining Meadow Pipit's nest on the common hitherto unused by the Cuckoo, for indeed we had so ordained it.

On looking this morning to see if the Pipit had laid her fourth egg, Smyth and I could hardly believe our eyes when we saw, instead of the expected four eggs, the Cuckoo's egg lying on its small end against three of those of the fosterer, in such a position as showed that it had only just been laid there and that the Pipit had not touched the eggs since ; moreover, the Cuckoo's egg was still quite warm, the other eggs cold. We looked at our watches and it was exactly 9.40 a.m., well over three hours earlier than any of our previously recorded times. The Cuckoo had shown us this nest during the manœuvres of two days ago, and I had specially arranged for my eldest brother, Macomb Chance, who had travelled from Scotland, to see to-day's last egg laid.

Constant observation for days following left

FOURTH SEASON (1921): RECORD 149

us in no doubt whatever that the Cuckoo did not lay again. In fact, we had so manipulated matters that no more of her natural fosterer's nests should be available, and consequently that inducement for her to resume laying would be wholly lacking.

On June 22 the fourth nest of No. 7 pair, from which we had taken the Cuckoo's eleventh egg on June 5 with two of the fosterers, replacing the eggs with substitutes, now contained three hatched Meadow Pipits and a newly-laid egg of a strange Cuckoo, placed there since the 20th (see p. 142).

Before discussing a few features of Cuckoo A's fourth season, a tabular record of her layings is given here.

CUCKOO A'S FOURTH SEASON'S EGGS

No.	Date.	Fosterer.	Time of laying.	Particular pair of Pipits victimised.	No. of Fosterer's eggs when combined.
A ¹	May 12	Meadow Pipit	5.5 p.m.	No. 6	4
A ²	" 14	"	1.55 p.m.	No. 4	2
A ³	" 16	"	4.26 p.m.	No. 9	1
A ⁴	" 18	"	4.15 p.m.	No. 5	2
A ⁵	" 20	Tree Pipit	2.50 p.m.		2
A ⁶	" 24	Meadow Pipit	5.10 p.m.	No. 6	4
A ⁷	" 26	"	2.20 p.m.	No. 4	3
A ⁸	" 28	"	5 p.m.	No. 9	3
A ⁹	" 30	"	5.25 p.m.	No. 6	1
A ¹⁰	June 1	"	4.20 p.m.	Nos. 3 and 4 combined	1
A ¹¹	" 5	"	5.18 p.m.	No. 7	3
A ¹²	" 7	"	3.50 p.m.	No. 9	4
A ¹³	" 9	"	1.15 p.m.	No. 6	3
A ¹⁴	" 11	"	4.0 p.m.	No. 5	5
A ¹⁵	" 13	"	9.40 a.m.	Nos. 3 and 4 combined	4

One Egg by Another Cuckoo

E June 21 or 22 Meadow Pipit No. 7

Now it will be seen that the Cuckoo laid her fifteen eggs this year in three runs of five each, breaking her sequence on May 22 and June 3. It is also interesting to note that the runs of five eggs correspond with the number of pairs of Meadow Pipits on the common. Doubtless several of the laying times would have been a little earlier than they were had we not disturbed the Cuckoo by the placing of hides near her selected nests.

As I had expected, the Cuckoo ceased to lay after we had cut off the supply of her natural fosterers, which we did by allowing certain of the pairs to hatch off substituted eggs of other Meadow Pipits brought from a distance. Personally I am of the opinion that she would have laid more eggs had we continued to restart the Meadow Pipits building; in fact, by assisting the Cuckoo in 1920 to break the record as I had desired, and by discouraging her from laying more than fifteen eggs this year, as I also intended, I contend that I have provided strong evidence in support of my contention that the number of eggs a dominant Cuckoo will lay is in a large measure dependent upon the regular supply or otherwise of nests of her natural fosterer.* After June 13 the female Cuckoo was not heard to

* See Chap. XII.

PLAN OF THE COMMON,

SHOWING
FOSTERERS' NESTS,
CUCKOOS'
OBSERVATION
TREES, Etc.

SEASON
1921

N.B.—The Common is surrounded by forest on three sides, north, west, and south, from a point near tree L round to a point near the 100-yard mark in the scale.

[P. 150.]

“ bubble,” and with the exception of a call or two by a male bird, no Cuckoo notes were again heard on the common.

Further consideration of this Cuckoo will be left until after I have dealt with this season's experiences of other Cuckoos on another common some three miles distant. To these I shall add some observations of three enthusiasts who have co-operated with me in studying, in different localities, Cuckoos parasitic upon other species of fosterers.

CHAPTER IX

OBSERVATIONS ON ANOTHER COMMON (1921)

DURING the 1920 season one or two friends and myself had some slight experience of a second common, situated about three miles away from the scene of the observations recorded in the previous chapters. In the early part of this year (1921) I determined to put into force my system of studying the Cuckoos on this second common, provided I could secure the necessary help. In this I was fortunate, and whilst being myself responsible for the first common, the second came, for the most part, under the charge of Messrs. P. B. Smyth, C. H. Roper, C. E. Baker, O. R. Owen, and the Rev. Allan Ellison, who conducted operations of the greatest interest and ornithological value.

This second common is of quite a different character from my original one, for whereas the latter is clothed with short gorse and bracken, the former is practically covered with a dense growth of heather which makes it far more difficult for all concerned, both Cuckoos and human beings, to

find the nests of the Meadow Pipit fosterers. And seeing that the fosterers numbered at the very least some two dozen pairs, it was of course impossible, owing to the denseness of the herbage, to manipulate their layings and relayings in such a way that the nest which the Cuckoo would select upon a particular day would be known beforehand to a like degree of certainty. In these circumstances it was necessary to rely to a greater extent than I have previously described upon the Cuckoo herself for most of the results obtained. But in any area there are without question particular observation posts which are used by Cuckoos, and once one has become familiar with these posts, one has overcome much of the difficulty of getting into sufficiently close contact with the Cuckoo to enable one to observe her in her most intimate moments.

From what little information we had gathered last season about this common there appeared to be about four Cuckoos victimising Meadow Pipits upon it. This season we took from it the eggs of five different Cuckoos, and the star performer, which laid a series of fourteen, we nicknamed "Mary Pickford." She laid on the following dates : (1) May 19 ; (2) May 21 ; (3) May 23 ; (4) May 27 ; (5) May 29 ; (6) May 31 ; (7) June 2 ;

(8) June 4 ; (9) June 6 ; (10) June 8 ; (11) June 10 ; (12) June 14 ; (13) June 16 ; (14) June 18, and she was actually seen to lay all but three of these fourteen eggs. Incidentally we found one of her eggs last year, on June 26. A second bird was Cuckoo L, which laid three eggs on May 17, 19, and 21, after which no more of her eggs were found, and it is highly probable that "Mary Pickford" would no longer tolerate her rivalry. A third bird, Cuckoo M, laid on May 25, and we saw no more of her on this common, but we did find another of her eggs on still another common about a mile away. A fourth bird, Cuckoo N, also laid two eggs, one about June 14, the other about the 20th, but of these more hereafter. A fifth Cuckoo, K, who was here last year, laid but one egg and that on May 31 in the Meadow Pipit's nest from which "Mary Pickford's" sixth egg had been taken at 4.10 p.m. on the same afternoon.

It was gratifying to find that my Cuckoo A and "Mary Pickford" were laying on alternate days, since it enabled the observers on both commons to take opportunities of seeing both birds, and also to give assistance when additional watchers were called for. So it came about that I was able to be present at many of the most interesting occurrences

on the second common without missing anything of moment on my own.

The day-to-day details are purposely omitted, for I feel that readers will by now have had quite sufficient of them. So the chief features will alone be dealt with, taking first the dominating Cuckoo, "Mary Pickford."

At the laying of her second egg on May 21 she, after various manœuvres, was between 3.45 p.m. and 4 p.m. seen to make three floats to a certain spot. At the third attempt she remained on the ground for fully ten minutes before returning to her observation tree, a birch. P. B. Smyth then went to the spot and after a close search found a well-concealed Tree Pipit's nest with one egg. Bearing in mind the great difficulty he had seen a Cuckoo to have in finding a nest on the 19th, he thought he would place a dummy nest in an open spot close to the one he had just discovered. So he and Owen went and fetched a Meadow Pipit's nest with four eggs, and on their return found the Cuckoo on the ground again searching apparently for the Tree Pipit's nest. Smyth placed the dummy nest on the edge of some short heather about three feet from the Tree Pipit's nest, whilst Owen went to fetch Hawkins, who was with them that day,

as the position was most favourable for filming the Cuckoo's glide. The Cuckoo seemed most anxious to return to the spot, but Smyth was standing there and so of course prevented her. At 5 p.m. they fixed up the camera in the open without a hide, but the Cuckoo naturally would have none of it, and disappeared. At 5.40 she returned, and at 6.30 she floated down twice, but the camera frightened her. They came then to the conclusion that nothing could be done without a hide, so took the camera away. At 6.50 p.m. the Cuckoo floated down from another point and landed twenty yards wide of the nest. She returned to her original birch at 7.3 p.m. and floated down to the exact spot. Two minutes later she flew up and away. On going to the spot the observers found that she had deposited her egg in the dummy nest and taken away one of its previous contents.

Smyth, Owen, Hawkins, and Helme then joined the rest of the party including myself, who had been watching Cuckoo L and hustling her about the common since 4.30 p.m. We were trying to drive this Cuckoo, which was floundering about in the deep heather like a pigeon with a broken wing, towards a Meadow Pipit's nest with two eggs for which she was evidently searching. Occasionally

she would make short flights, when those nearest to her would drive her back again ; she appeared to be exhausted by her vain search in the long heather. Thereupon two dummy nests were put down in open places near the nest she was looking for, but she always just missed finding them. This went on until 8.10, when the Cuckoo flew away and we thought that she had gone for good. But at 8.20 she was back again. At 8.30 she flew into some shortish heather, close to a well-concealed Meadow Pipit's nest. P. B. Smyth put down the same dummy nest he had so successfully used for " Mary Pickford." At 8.47 the Cuckoo was back and close to the dummy nest. Three minutes later she found it, rushed at it, sat upon it for about five seconds, and then flew rapidly away from right off the nest. At last she had laid her egg, and taken away one of the two that were in the nest. Some Cuckoos find nests far more easily than others, and Cuckoo L was the greatest duffer that we have yet met. Several other Cuckoos joined in from time to time during the manœuvres, the agitation of Cuckoo L evidently being the attraction.

On May 23 " Mary Pickford " laid her third egg, and as Hawkins had the best view I give his account of the day's operations.

“ After spending most of the morning in a hide near the thick crab-apple tree (a favourite Cuckoo observation post) hoping to get some film of the female Cuckoo in the tree, P. B. Smyth came across to tell me that a Cuckoo was moving about on the ground in a neighbouring field. We carried the hide and my gear across and fixed up the hide near the place to which she had been gliding. Smyth placed a dummy nest in a line with the hide and the Cuckoo's tree so that I could get her glide. I settled down inside the hide to await the blowing of the whistle which was to be the signal that she had started. The whistle blew, but as I had seen her start from the tree I was already turning the handle. The Cuckoo glided down but unfortunately alighted to the left of the hide. As she was out of the picture I left off turning and watched her instead. She walked about evidently searching for a nest and all the time two, sometimes three, Pipits were pecking at her, flying on to her, and pulling feathers out of her back; she really did very little to stop them, only emitting a curious noise, a sort of grunt, apparently in defiance or as a warning. For some minutes she continued to search and then flew away.

“ Some minutes later she again glided from her tree and alighted in the same place as before. Practically the same things happened as previously,

and, after a few minutes of unsuccessful search, she again flew away. Smyth then came across to me, and we decided to move the dummy nest to a spot near to where she alighted on the two previous occasions ; the nest, containing three eggs, was placed in a most open spot where from the hide I had an entirely uninterrupted view. The whistle blew and I started to turn the handle of the camera, but soon stopped as the Cuckoo alighted just outside the area covered by the lens. She pottered about, still heckled by the Pipits. At one time I noticed a Pipit with its beak full of Cuckoo's feathers, distinctly proving its antipathy to Cuckoos prowling around its neighbourhood. The Cuckoo continued to search, at one time going quite fifteen yards away from me. Eventually she came towards me again, Smyth having walked round into her view and slightly frightened her so that she took a short flight of ten yards. She still searched, until at last she saw the nest. She ran to it, dived her head into it and then pushed herself forward until she lay right on the nest, her tail being towards me and her head practically in the heather at the back of the nest. For eight to ten seconds she lay perfectly still, looking for all the world like a pigeon. I am not sure what the Pipits were doing at this time for I was concentrating on the Cuckoo. She then flew right off the nest and disappeared from my

sight. Smyth came across and found that she had laid her egg and taken one of the three eggs of the Pipit away with her."

Now when, as Hawkins says, the Cuckoo ran to the nest and dived her head into it, she was evidently picking up the fosterer's egg as she went on to lay. A camera picture taken on another occasion by Miss Turner proves that the Cuckoo first picked up the egg and held it in her beak whilst laying. This was at the laying of "Mary Pickford's" fourth egg on May 27. After preliminary manœuvres by P. B. Smyth and the Cuckoo the latter at 2.17 p.m. made her first glide to a Meadow Pipit's nest with one egg, which was wonderfully well concealed in deep heather. Smyth placed a dummy nest within two feet of this and Miss Turner was installed in a hide in a good position for taking photographs. The Cuckoo glided again at 2.53 p.m. It was raining heavily and bitterly cold, and shortly afterwards the Cuckoo disappeared. At 3.30 she appeared behind the hide and then flew into her observation tree. She glided down at 3.55 and as she approached took out an egg from the dummy nest, immediately flying off as Miss Turner released the shutter of her camera, being evidently frightened by the

click (see Frontispiece). She floated again at 4.15, and at 4.45 flew right away.

Whilst Smyth at 5 p.m. was helping Miss Turner out of her hide, the Cuckoo again floated down. But Miss Turner felt cold and exhausted and went to a farm for tea. Smyth took her place at 5.15, the hide then being eight yards from the dummy nest. At 5.20 the Cuckoo returned to her tree and glided down fifteen minutes later only to alight very wide of the nest. But at 5.47 she again glided, this time to the exact spot, and taking in her beak the remaining egg, laid her own egg in the dummy nest, carrying the Pipit's egg away with her. Whilst she was at the nest she was violently attacked by three Meadow Pipits, and, at the aforesaid distance of eight yards, Smyth could distinctly hear the impact as they buffeted her back and head. The Cuckoo alighted on the tall heather right above the Meadow Pipit's nest, and within two feet of the dummy, but for nearly a minute she had her work cut out to balance herself against the attacks of the Meadow Pipits. She made no effort to defend herself, beyond opening her great mouth, ducking her head, and uttering sounds as though she were swearing at her tormentors. Eventually she jumped down on to the grassy opening and ran

to the dummy nest, immediately taking out the remaining egg. She then turned round, sat lengthways on the nest, laid her egg in six seconds without the slightest effort, and flew swiftly away without sound.

Were it not that I have proved that the Cuckoo finds the nests in which to lay by watching the foster birds building them, it would be remarkable that the Cuckoo should have known of this well-hidden Meadow Pipit's nest, so well concealed that it would have done credit to a Grasshopper Warbler.* It is only, of course, when the nests are exceptionally well concealed that the Cuckoo has any difficulty in going to them when ready to lay. It is the best possible proof of the correctness of my theory that the Cuckoo first locates them when the fosterers are building, and then, when returning to lay, has no such direct guide to the exact spot.

A curious incident happened at the taking of "Mary Pickford's" sixth egg on May 31 soon after 4.10 p.m. She had laid her egg with three Meadow Pipit's, taking one away as she did invariably. Smyth replaced the eggs with three of another Meadow Pipit. At 7.30 p.m. Smyth and party returned to the nest to mark the substituted

* *Locustella naevia*.

CUCKOO ("MARY PICKFORD") LAYING 11TH EGG (1921): MEADOW PIPIT, INDICATED
BY ARROWS, STANDING BY.

eggs, and to their surprise found that another Cuckoo had been to the nest, laid her egg, and taken away one of the Pipit eggs. This was Cuckoo K, one of the four known to be on the common in 1920. The fosterer subsequently laid another egg.

On June 10 "Mary Pickford" laid her eleventh egg of the season, and was caught in the act by Hawkins, who secured, at a distance of only four yards, the photograph here reproduced (see p. 162)—the only one in existence that actually shows a Cuckoo sitting on a nest in the act of laying. Prior to her visit, the Meadow Pipit's nest contained three fresh eggs. At 4.25 p.m. "Mary Pickford," accompanied by one of the Pipits, alighted near the nest after the usual characteristic manœuvres so often described above. Approaching the nest, she at once lifted one of the eggs, sat down on the nest with her head hidden from view, and, while she so remained for seven or eight seconds was photographed, together with the Meadow Pipit. The latter, its head feathers ruffled with indignation or by the combat, may be seen, perched on the heather to the Cuckoo's left.

In contradistinction to some of her efforts "Mary Pickford" brought off the laying of her

twelfth egg on June 14, with only one glide, at 4.52 p.m. She found the nest, a Meadow Pipit's with two eggs on a ridge, in two minutes. The glide to-day was more of an ordinary flight than the usual float, the line from the observation tree to the nest being practically level. It is, of course, only when the nest is considerably below the level of the observation post that the floating glide can be used to perfection. On June 18 "Mary Pickford" laid her fourteenth and last egg of the season at 8 p.m.

I have illustrated at length occasions on which dummy nests were used and hope that at the same time it has been made clear that this method of inducing the Cuckoo to lay relies for its success upon there being a real nest which the Cuckoo is searching for in the near vicinity. It is perfectly obvious that otherwise there would be nothing to attract her to the spot.

The first of Cuckoo N's two eggs had an interesting little history attached to it. About that time we were very anxious for a Cuckoo's egg to hatch, as we wanted to film a young Cuckoo in the act of ejecting the contents of the nest in which it found itself. We did not want to leave one of "Mary Pickford's" eggs nor one of any other Cuckoo that

might lay in Meadow Pipits' nests on the common, since we required these eggs to illustrate the season's story. So we brought eggs from a distance and put them down in Meadow Pipits' nests ourselves. On June 10 we put a Cuckoo's egg from a Hedge-sparrow's (*Accentor modularis*) nest into a Meadow Pipit's nest with five eggs, removing two of the latter in exchange. On the evening of June 12 we found a three days' incubated Cuckoo's egg in another Hedge-sparrow's nest with four eggs, and exchanged it for the one we had used on the 10th, as we had reason to fear that it might be addled. On June 22 the Meadow Pipit's eggs hatched, and on the 24th I removed the still unhatched Cuckoo's egg, thinking that it was now no good. On blowing it, I found that it contained a live youngster. On comparing the eggs subsequently I found it to be a different egg from that transferred from the Hedge-sparrow's nest, and identical with another Cuckoo's egg N² found on June 20 in a Meadow Pipit's nest near by. Subsequent to our putting the Hedge-sparrow Cuckoo's egg in the nest on June 12, Cuckoo N must have laid in the nest and removed the Cuckoo's egg we had inserted. The Cuckoo's first act on approaching a nest to lay being the removal of one

of the fosterer's eggs, we have found in point of fact she takes, as one would expect, the egg which lies nearest to the outside edge of the nest, subsequently laying her own in the same spot.

To close this chapter I will relate an incident that occurred on May 29. It being an off-day on my original common, and the second common being in most capable hands, Owen and I motored to another district in the neighbourhood of K—— to hunt for nests of different species altogether.

Whilst wandering about on a common where he had taken Cuckoos' eggs a few years previously, Owen's attention was attracted by a Cuckoo flying past him, chased by five Meadow Pipits. The Cuckoo alighted on the ground and at that moment I came up. It was about 4.30 p.m. and together we realised that we had every likelihood of witnessing the laying of an egg. The Cuckoo evidently could not find the nest, and shortly returned to her perch in a tree about two hundred yards away. She again floated to the spot, flopped about in search of the nest, and once again returned to her tree. Thereupon I rapidly constructed a false nest and inserted therein three fresh Tree Pipit's eggs which we had taken earlier in the day. Whilst doing so, the Cuckoo made a

third glide, this time alighting in a rather different position and evidently having made sure of her mark, because, as we lay down not sixty yards from her, I saw her suddenly slip into a depression where she remained only while I could count ten, flying away immediately. Owen and I at once went up and found a Meadow Pipit's nest containing the newly-laid Cuckoo's egg, quite hot, and one egg of the fosterer. This egg bears so striking a resemblance to several taken by Owen on the same ground in 1917 as to satisfy any one that they are the product of the same Cuckoo.

CHAPTER X

SOME NOTES ON OTHER CUCKOOS (1921)

WHILST in the 1921 season I and my band of helpers were studying the ways of Cuckoos parasitic upon Meadow Pipits, I was fortunate in receiving the results of the year's work of three other Cuckoo enthusiasts, Messrs. G. J. Scholey, A. E. Lees, and E. E. Pettitt. Their attention, in three entirely different districts, was devoted in the main to Cuckoos parasitic upon Reed Warblers (*Acrocephalus streperus*), but the two first-named observers also produced some interesting results with Pied Wagtail (*Motacilla lugubris*) and Sedge Warbler (*Acrocephalus phragmitis*) Cuckoos respectively.

Mr. G. J. Scholey's Reed Warbler Cuckoo proved herself to be nearly as prolific a bird as my Meadow Pipit Cuckoo "A," for he obtained from her the very fine series of nineteen eggs, following on a series of sixteen laid by her in the previous season (1920), and six in 1919—apparently her first year. The area occupied by this Cuckoo consisted

of a reed-grown dyke in the shape of three sides of an oblong, and extending for about a mile from end to end of the cover. The continuous stretch of reeds is broken here and there by tall hawthorn and sallows, making, as it were, numbers of little reed-beds each distinct from one another. Each small reed-bed is occupied by one, and only one, pair of Reed Warblers. The Cuckoo uses the tall hawthorns and sallows as observation posts.

This Cuckoo had no less than five breaks in her laying period, the first presumably being due to lack of fosterers' nests in suitable condition, but the evidence available does not explain the other four. To give her performance in detail, she laid her first three eggs on May 14, 16, and 18 respectively, these being, as might be expected from the early date, the only Reed Warblers' nests available. According to Mr. Scholey, she laid her fourth, fifth, and sixth eggs on May 24, 26, and 28 respectively, the first of these again being the only nest in suitable condition. The Cuckoo now had her second break, of four clear days, and about this time many Reed Warblers' nests were coming along. Her seventh, eighth, ninth, tenth, eleventh, and twelfth eggs were laid on June 2, 5, 7, 9, 11, and 13 respectively. It will be noticed that she

deviated somewhat from her regularity of laying (every alternate day) in not laying on the 4th as was expected. Mr. Scholey attributes this to a very cold night on the 3rd retarding the progress of the egg; but I should not confirm that opinion.

Ensued a third break, the Cuckoo's thirteenth, fourteenth, and fifteenth eggs being laid on June 17, 20, and 23 respectively. Here we have a remarkable variation in laying times, two clear days elapsing between the deposition of each of these eggs.

After a fourth break this Cuckoo produced at normal intervals her sixteenth and seventeenth eggs on June 27 and 29 respectively. Then for the last time she took another rest, producing her eighteenth and nineteenth eggs on July 4 and 6, the last egg, as is so often the case, being a smaller one. Mr. Scholey states that this Cuckoo deposited her eggs between 1 p.m. and 2.30 p.m. (summer time) and invariably removed one or two of the fosterer's eggs in exchange for her own; but he did not wait by whilst she laid, for of course he did not know beforehand in which nest or upon what day she would lay.

This short account shows that this particular Cuckoo evinced that degree of variation in the habit of the individual which further research may prove to be characteristic of the species in general.

It should be added that these nineteen eggs were obtained from nests of a greater number of different pairs of fosterers than was the case with my Meadow Pipit Cuckoo A. In every case where Mr. Scholey took eggs he replaced them with others, brought from a marsh where Reed Warblers are particularly abundant, and allowed them to hatch, although in some instances the foster birds did forsake and rebuild.

Mr. A. E. Lees worked an area of some five miles along the banks of a midland river. This stretch was cut up into territories by five hen Cuckoos, three being parasitic upon Reed Warblers and two upon Sedge Warblers. Bearing away from the river in one direction he came into the territories of five more hen Cuckoos, parasitic upon Hedge-sparrows. In another direction he met with still another Cuckoo but found only one of her eggs, and that in a Pied Wagtail's nest.

Of his riverside birds the most prolific in 1921 was one duping Sedge Warblers, and from this Cuckoo he obtained the fine series of ten eggs, an achievement which, for that particular fosterer, has probably never been equalled in this country. One can only estimate the probable laying dates from the state of incubation of the Cuckoo's eggs,

but on this evidence she would seemingly have laid the ten eggs on the following dates or thereabouts : May 14, 18, 20, 22 ; June 5, 7, 15, 17, 21, and 27. But probably the actual number of eggs laid by this Cuckoo exceeded the ten which were found.

The next area was occupied by a Reed Warbler Cuckoo and their two territories overlapped. It may or may not be significant that the Sedge Warbler Cuckoo laid her first four eggs on that part of the overlapping territory before the Reed Warbler Cuckoo began to lay. After that, the former bird kept to her own end of the ground. This Reed Warbler Cuckoo laid seven eggs and after her first egg, deposited about May 27, she, judging from the evidence available, produced the remainder on dates approximating the following : June 3, 5, 9, 11, 13, 15.

Occupying the contiguous area was a second Reed Warbler Cuckoo which, having laid here for the preceding five seasons, produced in 1921 nine eggs on apparently these dates : May 17, June 6, 8, 12, 14, 18, 20, 22, 24. Her seventh egg was deposited in a nest which also contained one of a third Reed Warbler Cuckoo occupying the adjoining territory. The latter bird was apparently unprolific, only

three of her eggs being discovered throughout the season ; they were laid probably about May 26, June 18 and 28 respectively. The fifth territory was occupied by another Sedge Warbler Cuckoo, and of her eggs only two were found.

No great measure of success was met with amongst the Hedge-sparrow Cuckoos, the longest run being one of three eggs, and one of these was deposited in the nest of a Greenfinch.* But of course it is understood that the foregoing do not purport to be by any means the whole of the eggs laid by the Cuckoos concerned, only such as were found by Mr. Lees and his son.

Amongst Mr. E. E. Pettitt's results for 1921 was a series of eleven eggs from one Cuckoo parasitic upon Reed Warblers. These eggs were also not taken as laid, but from what evidence is procurable they were in all probability deposited approximately as follows : June 1, 3, 5, 7, 14, 16, 18, 20, 22, 26, and 28. It is possible that the Cuckoo found no fosterer in suitable condition at the time of her long break. A final search of her territory in July revealed no further eggs or young, and Mr. Pettitt is convinced that he overlooked no eggs of this Cuckoo. In the previous season this

* *Ligurinus chloris*, L.

Cuckoo had shared the territory, and at the beginning of 1921 two other Cuckoos each laid an egg at either end of the area, but nothing more was seen of them. The Cuckoo which laid eleven eggs evidently drove them off the territory.

In another locality a Reed Warbler Cuckoo produced four eggs and placed one of them in the nest of a Chaffinch * built in the same willow bush in which Chaffinches had a nest with a young Cuckoo in the previous season. This supports my belief that Cuckoos victimise the same individual foster birds season after season. Mr. Pettitt states there were only five pairs of her natural fosterers, and none of them had a nest in suitable condition at the time the Cuckoo deposited her egg in the Chaffinch's nest.

In a third area of a few acres, three Cuckoos attempted to establish themselves. The first-comer deposited an egg on June 2 in the only Reed Warbler's nest then available. A second egg was found on June 14, but on the same day eggs of two other Cuckoos were found in one Reed Warbler's nest. The area was not visited again until July 3, when I also was present, and together we found two eggs of one of the later Cuckoos, and also

* *Fringilla coelebs*, L.

two young ones which may or may not have belonged to her. Possibly she came in and laid an egg about mid-June, dismissed the other two Cuckoos, and then laid four more eggs about June 17, 19, 21, and 23.

Other Reed Warbler Cuckoos met with were unprolific birds, showing no particular interest, although one or two, of which much had been hoped, had their territories spoilt by cattle eating the reeds, from shortage of grass due to the drought.

CHAPTER XI

CONDITIONS GOVERNING THE LAYING OF CUCKOOS IN GENERAL

MORE than sufficient evidence has been produced in support of my theory, that a dominant hen Cuckoo, by a process of watching and searching, discovers some days in advance the nests of those dupes in which she intends subsequently to deposit an egg. I contend that the watching of her dupes engaged in building stimulates her own reproductive organs and the resulting egg is ready for extrusion about five or six days afterwards. It follows that within reasonable limits the number of eggs she lays is regulated by the number of suitable nests discovered ; though of course in cases of emergency a Cuckoo will sometimes make use of what are to her unnatural fosterers.

Ever since I began to study the subject, I have argued that the number of eggs that a Cuckoo *might* lay in a season probably depended in great measure upon the number of regularly available nests of the particular species which nature inclined

her to victimise, my opinion being that a Cuckoo will tend to deposit her eggs in the nests of that species in which her mother placed her eggs, or, in other words, her natural fosterers.

I know that the theory is original, and is challenged in some quarters eminently worthy of respect. For this reason I am desirous of making my meaning perfectly clear, and so will adduce evidence we have in support, although previous chapters may almost be said to have bristled with it. Here are some examples—

- (a) The nest in which the tenth egg of Cuckoo A was laid on May 31, 1920, was seen to be visited by the Cuckoo two days before, *i.e.* on May 29, when it contained one egg.
- (b) The Cuckoo was seen to fly on May 30, 1920, from the site of the nest in which on June 2 the Cuckoo's eleventh egg was seen to be deposited.
- (c) The nest in which her eighteenth egg was laid on June 18, 1920, was seen to be visited by the Cuckoo on June 15, when it contained two eggs.
- (d) The nest in which her twentieth egg was laid on June 22, 1920, was seen to be visited by the Cuckoo six days previously (on June 16), when it contained one egg.

- (e) The nest in which her twenty-first egg was laid on June 27, 1920, was seen to be visited by the Cuckoo on June 24 and 26, when it contained one and two eggs respectively.
- (f) On May 23, 1921, Cuckoo A watched No. 9 pair of Pipits building. She was seen to watch them again on the next day, and laid her eighth egg on May 28, when the nest contained three eggs.
- (g) On June 7, 1921, Cuckoo A visited the site of the nest which received her fourteenth egg on June 11, when it had five eggs.
Perhaps best of all—
- (h) On May 28, 1921, Cuckoo A when harassed visited the approximate site of the nest which did not even contain an egg of the foster bird until two days later, on which day the Cuckoo also laid there.

It is not necessary to give further instances, for they occurred throughout the 1921 season. Now it will not be disputed that the Cuckoo must have visited nests often unobserved. And we recollect any number of occasions when we watched the Cuckoo observing Meadow Pipits in the vicinity of their nests without actually flying down to them. But on no occasion (until we worried the Cuckoo

in 1921 with hides and cinema apparatus) had we observed a Cuckoo visit a nest without subsequently getting a Cuckoo's egg from that nest. Is it not, then, clear that the Cuckoo watches her intended dupes building and at their nests for the sole purpose of providing a fosterer for her own offspring?

I contend that the very sight of her natural fosterers preparing a home for their own young is sufficient to incite the female Cuckoo in occupation of that territory to reproduce her own species. It is at least significant, and pertinent to my theory, that the interval between the time at which the Cuckoo finds a nest and the time when she uses that nest for the deposition of her egg has been shown to correspond very much to the interval requisite to small birds before laying the first egg in another nest after the previous nest has been destroyed. And although it may not be generally realised, it is nevertheless a fact, and an interesting coincidence, that some of the eggs laid by a pen of hens will be found to be fertilised five days after the first introduction of a male bird.

If, then, it be conceded that the sight of her natural fosterers preparing a home for their own young is sufficient to incite the female Cuckoo to

reproduce her own species, will not the converse be true? And when the cause—fosterers building their nests—is absent, will not the effect, that is the desire on the part of the female Cuckoo to reproduce herself, be checked, at any rate to some extent? The fact that we decided in advance to try to stop Cuckoo A laying after she had laid fifteen eggs in 1921 is surely strong evidence, seeing that Cuckoo A did in fact lay only fifteen eggs in 1921.

Clearly, if it be true that the Cuckoo tends to place her eggs in the nests of that species by which she herself was reared, it stands to reason that each Cuckoo has to adapt its laying period to conform with that of its dupes. And since it has been so conclusively shown that at least very many Cuckoos confine their parasitism to one species, it does not affect the argument whether or no they themselves were reared by that species, although it is now generally accepted that they were so reared.

Assuming it to be now established beyond the possibility of controversy that the normal interval between the laying of the eggs of a prolific Cuckoo's series is a regular one of about forty-eight hours, it will probably be admitted by most ornithologists

that it would be almost impossible in any given and comparatively limited area for the breeding period of any one species to be so spread out, unless arranged artificially, as in the case of my particular studies, as to provide at least one new nest of that species, containing one or more fresh eggs, on every alternate day throughout a period of, say, six weeks from about mid-May onwards.

Reference to the record of the domestic economy of each pair of Meadow Pipits on my common in 1920 will show that the reduction of pairs from nine to four, attributed to a Kestrel searching for food for her newly-hatched young, began to make itself seriously felt about June 4-6. Until this time the Cuckoo always had more than a sufficiency of fosterer's nests available.

According to my theory, that reduction of accommodation would tend to check the laying of the Cuckoo about a week later. Hence the break after the laying of her sixteenth egg on June 12, 1920. But for the constant and rapid restarting of new nests of those fosterers left after the depredations of the Kestrel, it is more than probable that this Cuckoo would not have resumed laying after the deposition of her series of sixteen.

To sum up the foregoing remarks : I think that it is only reasonable to assume that a Cuckoo does not lay until the incentive to do so has first of all been provided by the sight of a pair, or probably more than one pair, of her particular dupes actively engaged in the preparation of their nests. The eggs thus "conceived" are subsequently fertilised, and ready to be laid at a time when her intended dupes have arrived at a period in their domestic affairs suitable to their reception. In the meanwhile the Cuckoo usually pays one or more visits to the destined fosterers' nests, probably in order to locate them precisely, and to assure herself of their satisfactory progress. From this can be deduced the reason for eggs of even dominating Cuckoos appearing in the nests of rare and uncommon fosterers, and for Cuckoos normally parasitic upon one species to make occasional use of a nest of another species. The reason is that some abnormal delay has occurred in the completion of the nest by the pair of dupes on which the Cuckoo had "conceived" her egg, and when the time comes that she is forced to lay it, she resorts to a nest of some other species that has come within her ken.

This is strikingly borne out in the case of

Cuckoo A. On each of the only two occasions in 1920 and 1921 when she laid an egg in a nest of a bird other than her natural fosterer, had she retained her egg one day longer, she would have been able to lay it in a nest of her natural fosterer in suitable condition, for which nest I believe such egg was intended. Observe, moreover, that the exceptional act of laying an egg in a Tree Pipit's nest was promptly followed in each case by a break in the Cuckoo's laying sequence.

In other words, when a Cuckoo is forced to desert her natural fosterer, the stimulus to reproduction is checked. Hence my belief that when a Cuckoo is driven from her natural fosterers by a more dominant Cuckoo she will not lay many eggs unless and until she becomes reconciled to the adoption of another species of fosterer. This is a line of inquiry I am anxious to see pursued.

It can be readily understood that in the meantime such a Cuckoo lays such eggs as nature demands, depositing them haphazard; hence the exceptional cases of Cuckoos' eggs being found fresh in nests containing eggs well advanced in incubation or even in nests from which the young have flown. I do not believe this possible in the case of a "dominant" Cuckoo.

Moreover, it would appear from our experiences in putting down dummy nests that Cuckoos may at times make genuine mistakes ; but it would of course be ridiculous to expect a Cuckoo to lay in a substituted nest put down anywhere regardless of whether the Cuckoo intended to fly thereabouts to a nest previously discovered.

CHAPTER XII

THEORY OF DOMINATING CUCKOOS

WITH most species of birds it is probably the males which secure desirable breeding grounds and hold them against the advent of the females. The whole system has been ably expounded by H. Eliot Howard in his recent work *Territory in Bird Life*, in which he claims that one of the uses of song is to announce to unattached females the whereabouts of males which are in possession of serviceable nesting areas, and so are open to take a mate. With Cuckoos the proceedings would appear to be somewhat different. There being no nest, no sitting mate nor young for which to provide protection, the influence of the males in the selection of the breeding territory proper is likely to be very slight. A hen Cuckoo in her first year is not improbably attracted to the place of her upbringing; and until she has been able to establish her claims, as regards both territory and natural fosterers, she doubtless wanders about in the vicinity, as near by

as may be permitted by other hen Cuckoos. And where there are hen Cuckoos, it is only natural to expect to find male Cuckoos there too. It is the custom with at least many hen Cuckoos annually to return to the territory occupied in the previous season, and it is more than probable that competition for the best breeding areas is keen. It is likely that individual Cuckoos not endowed with a dominating nature fare but poorly in their reproductive efforts, and instead of depositing a large series of eggs in a season may have to content themselves with a very small number indeed.

Fortunately, the facts which I have set forth concerning the Cuckoos A, B, E, and F, one or more of which appeared on the common during the four seasons 1918-21, serve admirably to illustrate my points. In the first season we have A, which I take to have been then a young bird—for in 1916 she was certainly not there—in sole possession until some time about the beginning of the second week in June. Then, as A's period of laying activity is on the wane, B appears. On more than one occasion we find both Cuckoos making use of the same fosterer's nest, and if it were A's first season, I would not expect her to rid herself entirely of B. But I have yet to experience

conditions in which, in two consecutive seasons, the same two Cuckoos lay concurrently in nests of the same species of fosterers on one and the same territory.

In the second season there was quite a different state of affairs. A had developed her full powers and become a truly dominant bird. She kept the common entirely to herself until she had finished laying, and then, and not until then, B was allowed to enter and deposit two eggs. In the third year (1920) we found an egg of B on May 15 in the nest of a Linnet with three of the rightful eggs, and that was the only trace of her seen throughout the season.

But later in the same year 1920 an entirely new Cuckoo, F, came to the common, and had before noon on June 14 deposited an egg in a Meadow Pipit's nest, since it had been victimised by A with her sixteenth egg on June 12. A reference to the detailed notes for that period will show that this was about the time of the crisis in A's domestic affairs, and her vigilance was no doubt so far relaxed as to afford F the opportunity to slip in and use unmolested a nest for which A had no further need. Cuckoo F also laid one only out of six eggs found on another common within ten days

previously—evidence that F was a wanderer there too. There was no sign of this Cuckoo in 1921, further corroborating the theory that F was without territory.

Now to consider Cuckoo B. Where had she been all through the second season, 1919, until her first egg found was laid on the common about June 28? and how came it that she was on the spot and ready to enter as soon as A had finished for the season? It can be presumed that in the absence of A she would have occupied the territory, for she had utilised it in the previous season and attempted to do so again in the third. It can also be assumed that she remained in the vicinity and found no suitable vacant territory in the second year, else she would not have been at hand to enter upon her original ground at the very moment that it became free to her. Study of the doings of Cuckoo A shows that the procedure necessary to achieve a successful egg-laying covers a matter of several days, since for this purpose she keeps a close watch from her several observational trees upon the activities of the fosterers in her territory. From this it is to be deduced that a Cuckoo, without a territory of her own, condemned to wander, has immensely curtailed chances of finding dupes. She will not as

a rule "conceive" an egg on any but her natural fosterers, and where these are in convenient numbers upon a desirable territory, there will she probably find a dominant Cuckoo in occupation. Without a territory of her own, or without the power to hold one for her exclusive use, a Cuckoo can have but few opportunities to perpetuate herself. It is thus highly improbable that B laid many eggs in her second season; it is even possible that she laid no more than the two discovered on the ground she occupied in her first year.

We have Cuckoo A adhering solidly to her territory, successfully keeping out all opposition. Cuckoo E laid one egg only on the common in each of the years 1919 and 1921, but in each instance it was at the end of A's season. Cuckoo F only did so once, in 1920, when, as has been already pointed out, there was a break in the regularity of A's laying.

The obvious conclusion is that Cuckoos E and F were wanderers in the vicinity, submissive to dominant Cuckoos, and anxious to trespass on A's territory, but only able to lay a casual egg therein when her vigilance was relaxed.

Of the territorial system in vogue amongst female Cuckoos there is superabundant evidence,

and the fact is so well known to all who have practical field-knowledge of the Cuckoo that it needs no re-statement. The only qualification necessary is that the most successful results in this country have been produced by investigations into Cuckoos parasitic upon Meadow Pipits, Reed and Sedge Warblers, and in a lesser degree upon Robins, Hedge-sparrows, and Pied Wagtails. So far as I know, there is yet no one who can show a long and genuine series of eggs of one Cuckoo in one season from nests of any fosterers but the three first mentioned. Doubtless this is owing to the greater difficulties one meets with in discovering a sufficiency of the nests of other dupes in any given territory. That at least many Cuckoos will not willingly make use of the nest of any fosterer not belonging to the species which they are accustomed to victimise is well shown by the history of Cuckoo A, also by that of "Mary Pickford," and the most prolific birds mentioned by Scholey, Lees, and Pettitt—all of them, it may be noted, dominant Cuckoos.

Mr. Pettitt says that though he has taken hundreds of Cuckoos' eggs from Reed Warblers' nests, he can, in this wide experience, recall very few instances of Cuckoos which habitually dupe that

species depositing an egg in nests of other birds. In one case a prolific Cuckoo opened her season by twice making use of Sedge Warblers' nests before the Reed Warblers had begun to build. Later, the same Cuckoo used a Lesser Redpoll's* nest, certainly owing to the fact that all Reed Warblers' nests with eggs had recently been removed. She also victimised a Marsh Warbler's nest, but whether from choice or necessity was not noticed. I believe it to be usual for Reed Warbler Cuckoos to ignore totally even the Sedge Warblers breeding in their areas.

Of the possibility of there being Cuckoos which will willingly and indiscriminately victimise any species of small bird with which they may meet, there is little or no evidence. Until I see an undoubtedly genuine series of eggs, laid in one season on one territory by one Cuckoo, taken from the nests of several species utilised at random, I shall hold to my belief that this kind of impartiality amongst dominant Cuckoos is of very slight account, even if it exist at all. And if it does exist at all, I should expect to find it only in the case of first-year Cuckoos.

Of late years there has been a tendency to over-

* *Linota rufescens*.

estimate the number of eggs laid by a Cuckoo in a season. Whilst, as I have shown, a Cuckoo can and will lay up to twenty-one eggs, yet she is not likely to do so under normal circumstances. The opportunities to do so are very seldom existent, and the earlier ornithologists, who placed the Cuckoo's average clutch at four to six eggs, were almost certainly far nearer the truth than the later observers, who, in basing their calculations upon the large series obtained by systematic endeavour, completely overlook the very important fact that they have themselves, by taking the Cuckoo's eggs as laid, together with those of the fosterers, provided her with a stimulus conducive to her further laying.

Additional evidence of dominating Cuckoos will be found on referring back to Chapters IX and X.

CHAPTER XIII

FOSTERERS OF THE CUCKOO

It is quite evident that, difficult as it will be at any time to obtain the *complete* series of eggs laid by any one Cuckoo throughout a season, it may be regarded as impossible to obtain, or at least to be certain that one has obtained, such a series from a wandering Cuckoo which might possibly be inclined to deposit her eggs more or less indiscriminately in the nests of different species.

It is, of course, practically impossible to ascertain definitely what proportion of Cuckoos incline to follow the natural tendency to place all their eggs in nests of that species which acted as their own fosterers. Personally, I think that Cuckoos, when failing to make use of their natural dupes, only do so either from necessity or by accident. Such cases arise when a selected natural dupe fails to provide a nest on the due date—compare Cuckoo A when in each of her third and fourth seasons she utilised a Tree Pipit's nest instead (as I

claim) of an intended Meadow Pipit's. Another instance is given in the preceding chapter when a Reed Warbler Cuckoo was forced to use a Lesser Redpoll's nest, which, owing to the recent destruction of the nests of her natural fosterers for one of which she had "conceived" her egg, was the only nest in suitable condition near at hand.

Once an egg has reached a certain stage of development the Cuckoo is of course compelled to lay it, and this is quite sufficient to account for many of the unusual dupes which are recorded from time to time. There must, of course, be occasions when the intended fosterer's nest meets with some accident between the original discovery and the laying of the Cuckoo's egg.

The accounts already given of our experiments with dummy nests prove that Cuckoos must blunder perhaps more often than might be supposed. Searching laboriously for the nest that she knows ought to be somewhere near, she comes across another nest in suitable condition and makes use of it for her egg.

It is possible that dominating Cuckoos may also be instrumental in causing a Cuckoo of submissive temperament to use a nest other than she intended. Take the case of Cuckoo B depositing her egg in a

Linnet's nest which was found in A's territory on May 15, 1920. Now the Linnet's nest, very low down in the gorse, was only four yards away from the Meadow Pipit's nest which contained the first egg of A. It is more than likely that B had intended her egg for the Meadow Pipit's nest, beginning almost before A had started. It is most likely that, on flying down to lay, B mistook the Linnet's nest, which she found the more readily, for the Meadow Pipit's in which she intended to lay. But it is also possible that A resented her presence, flustering and perturbing B to the extent that she became careless in her choice.

The numerical list of Cuckoo fosterers is a very long one and embraces almost every species of small bird breeding where Cuckoos range. But as the great majority have only been recorded in rare instances, it is good negative evidence that it is foreign to the nature of Cuckoos to make use of any but their natural fosterers. Eggs of Cuckoos are comparatively rarely found away from the nests of the common run of hosts, and it is at least open to doubt whether in many instances uncommon fosterers, especially unsuitable ones, succeed in rearing the young interloper to maturity. And there is not much doubt that the percentage of

desertion by uncommon fosterers is far higher than that by normal hosts.

Be that as it may, we find that in our islands the usual dupes of the Cuckoo are the Meadow Pipit, Reed Warbler, Hedge-sparrow, Pied Wagtail, Robin, and Sedge Warbler. After these come the Tree Pipit, Yellow and Grey Wagtail, White-throat, Blackcap, Garden Warbler, Yellow Bunting, Reed Bunting, Spotted Flycatcher, and Skylark, all of which, in particular localities, may have Cuckoos regularly parasitic upon them. Other fosterers, such as Willow Wren, Chiffchaff, Linnet, Chaffinch, Greenfinch, Nightingale, Song Thrush, Blackbird, etc., belong, very possibly, to the accidental category.*

Now in any one season by very far the larger number of Cuckoos' eggs found are in nests of the first half-dozen species mentioned, although the second division of dupes make a fair show. Eggs discovered in the nests of other species form a very small percentage of the whole number, so small indeed that it can reasonably be taken as evidence that Cuckoos do not normally deposit their eggs away from the customary fosterers. No one has

* The scientific names of all these birds will be found in the list on p. xiii.

yet shown a series of eggs by one Cuckoo taken from nests of Chaffinch, Greenfinch, Willow Wren, etc.; and it is at least possible that with such species are lacking the conditions necessary to the establishment of a race of Cuckoos persistently duping them.

It is probable that the *modus operandi* of the Cuckoo in egg-deposition is in the case of at least all ground-nesting species similar to that I have so often described with Pipits. Our investigations have shown that it was not merely the habit of one individual Cuckoo to lay when sitting on the Pipit's nest, but the action of the several Cuckoos which came under our observation. But there is no doubt that many Cuckoos do not lay in the nests of their dupes, since their eggs have been taken from nests in holes to which it would have been impossible for the parasites to have obtained access for the purpose of laying. Where the Cuckoo cannot lay in the nest of the destined fosterer it must still remain a matter of pleasant if unprofitable speculation as to what she does. Having laid her egg, it is believed that she transfers it in her bill to the chosen receptacle. There has been much controversy over the Cuckoo's exact method of carrying her egg. Some writers, such

as H. S. Davenport, stoutly maintain that she carries her egg in her throat, but no unimpeachable evidence has been adduced in support of so improbable a theory. We now have indisputable evidence that many Cuckoos carry away in their bill the foster bird's egg which they have robbed; why then, when unable to sit on a nest to lay, should a Cuckoo elect to swallow her own egg instead of carrying it also in her bill?

Although it may be said that my opinion is biassed because I have seen Cuckoos lay in Meadow Pipits' nests, yet I shall not be at all surprised if it is proved before long that it is customary for Cuckoos to lay in the nests of most species of fosterers, whether ground-builders or not. There is no particular reason to assume that the habit is confined to Meadow Pipit Cuckoos.

With my deep interest in Cuckoos, it goes without saying that I have studied innumerable recorded observations and read everything on the subject that I have been able to secure, to say nothing of countless discussions and comparisons of notes. Speaking generally, I have found that many so-called observations are capable of more than one interpretation, and it must be remembered that up till now observers have witnessed Cuckoo

incidents only by accident, and not, as my colleagues and myself have, by design. So I have found very little indeed that throws light on the way Cuckoos deposit their eggs in nests of species such as Hedge-sparrows and Reed Warblers, etc. It is true that on a good many occasions Cuckoos have been seen with *an* egg in the bill, and observers have seemingly jumped to the conclusion that the Cuckoos were carrying their *own* eggs, for no one could determine the identity of the egg under such circumstances. And in view of the fact, which we have been able to establish, that the actual laying of the egg can be accomplished within eight seconds, is it likely that any one will ever know accurately what the exact procedure is, in the case of other Cuckoos, unless and until they have followed our lead and have so controlled the Cuckoo's operations as to force her to lay in a nest appointed for her and have watched her while doing so?

But there is one piece of evidence that certainly points to Cuckoos laying in the nests of Hedge-sparrows. In 1920 Miss Hilda Terras produced a little book entitled *The Story of a Cuckoo's Egg*, which gave her observations for a season upon a pair of Hedge-sparrows victimised by a Cuckoo. I

quote her account of the egg-deposition by the Cuckoo :

“ I saw a bird suddenly sail quickly down from the roof above me, and fly on to the hedge about two feet from the nest. - It was the Cuckoo. . . . There it sat, nervously turning its head this way and that, and looking about it in the same stealthy, cunning way that it had done on the occasion of its previous visit. . . . And then, without any hesitation, it hopped straight into the hedge and disappeared from view. For about a minute it was there ; then it came out and flew away. Burning with curiosity, I hurried into the garden, and, eagerly parting the branches of the hedge, looked in to the nest, and lo and behold, there, lying in Henrietta's (the female Hedge-sparrow) dear little cup-shaped, softly-lined home, I saw the Cuckoo's egg ! One of my sisters had again watched the whole affair with me. . . . ”

Now here again we have evidence of the Cuckoo's previous visit, and also the glide (“ sail ”) to the nest. If she had been carrying her egg in her bill, surely one or other of the observers would have seen it when the Cuckoo sat on the hedge, “ nervously turning its head this way and that, and looking about it. . . . ” To me, at least, it is obvious, in the light of my own experience, that

the Cuckoo laid *on* the nest when she hopped into the hedge and disappeared from view for about a minute. Very possibly she was really not there nearly so long as a minute, judging from the speedy laying performances of our Meadow Pipit Cuckoos.

In the fourth volume of his *Vögel Mitteleuropas* Naumann states that he saw a Cuckoo lay its egg in a Reed Warbler's nest, and further that it held itself in position by pressing its wings and tail against the reeds surrounding the nest. There cannot be much doubt about the accuracy of this observation, if only for the reason that it would scarcely have occurred to Naumann to make the statement with such detail unless he had witnessed the happening.

When Reed Warblers' nests contain Cuckoos' eggs they are almost invariably tilted sideways. This could, of course, very well come about from the Cuckoo standing on the rim to deposit her egg with her bill. But my reading of it is that the tilt is caused either by the Cuckoo "taking-off" after laying on the nest, or, as is perhaps even more probable, by the downward pressure of the Cuckoo's tail in the act of laying, which is so clearly illustrated in the film photographs. Whether she backs out as she does from Meadow Pipits' nests or goes straight forward, the flimsy nest is not usually strong enough

to show no trace of the Cuckoo's visit. However, any one studying the Cuckoo by my system should have little difficulty in discovering her way with the Reed Warbler. I shall expect it to be found that she lays on or over the nest.

In 1897 the *Field* published a record of a Cuckoo having been seen to sit on and lay her egg in the nest of a Pied Wagtail.

Probably most practical ornithologists have noticed that nests in certain spots are victimised by Cuckoos season after season. This of course is because the nests are built within good view of favourite Cuckoo observation-posts; and it may be a pair of foster-birds which the same Cuckoo has victimised in previous seasons. A patient watch kept on such a nest as soon as the owner has laid an egg would no doubt result in the observer seeing a Cuckoo in the act of egg-deposition; but unless my method is employed one cannot tell on which out of four or five days the Cuckoo will lay in that nest, if lay she does.

Since the individuals of at least most species vary enormously in temperament, a fact well known to all bird-photographers, it is reasonable to assume that the behaviour of fosterers of other species customarily victimised by Cuckoos runs

through the gamut of emotions displayed by the Meadow Pipit dupes I have described in earlier pages. It will be remembered that some pairs actually seemed to court the attentions of the Cuckoo, whilst others attacked her with as much violence as they were capable of showing. Nevertheless it can be taken as certain that the usual dupes of the Cuckoo are amongst those species which as a whole show the most complacency, and will usually—the Hedge-sparrow for example—“sit on anything.”

CHAPTER XIV

REMOVAL OF EGGS FROM FOSTERERS' NESTS

IT has been seen that Cuckoo A invariably removed one of her dupe's eggs in exchange for her own throughout her record series of twenty-one eggs in a season (1920). This was also the case in her 1921 season, as well as with other Cuckoos of which particulars have been given. That this is the usual custom of Cuckoos in general is well known, but there are many side-issues of this practice which are not so familiar. It may be mentioned that this instinct of egg-removal by the Cuckoo seems occasionally to be in abeyance, and there are grounds for believing that at other times it acts with increased force, inducing the parasite to remove two eggs instead of one. The habit is obviously beneficial to Cuckoos, inasmuch as it greatly enhances the chances of their eggs being accepted by their dupes, and so Cuckoos acquiring the habit stand the best chance of survival. But it is not safe to take it for granted that the Cuckoo

has always been responsible for removal when the number of eggs in a nest falls short of what it should be. I shall shortly bring forward evidence in support of the theory that in occasional instances the dupe will remove one or more of its own eggs.

To the *Ibis* for January, 1918, C. F. M. Swynnerton contributed a very interesting and instructive paper on "Rejections by Birds of Eggs unlike their own; with remarks on some of the Cuckoo Problems." In it the author describes his experiences of many experiments in interchanging and substituting eggs of several species breeding in South Africa. Some birds showed a very fine discrimination, others accepted almost anything. Herein we may see a reason why Cuckoos are parasitic mainly upon certain species; for the less discrimination and resentment shown by the dupes, the greater is the chance of the embryonic young Cuckoo being hatched and reared to take its place in the perpetuation of the race.

As pertinent to my present subject I quote one of Mr. Swynnerton's results—

"On another occasion a Stonechat (*Pratincola torquata*) adopted a Shrike's egg (*Lanius collaris humeralis*) given her in place of one of her own three. Several days later she was still sitting on

it. I now replaced a second of her eggs with another Shrike's egg. When I revisited the nest it was deserted and the Stonechat's egg was gone, the two Shrike's remaining in possession. I am inclined to believe that the Stonechat, finding the substituted eggs beyond its powers of ejection, accepted it perforce for the time being, and later removed its own egg. . . . In the case of a Warbler (*Cisticola natalensis*) there was suggestive evidence—in the form of a fresh hole made low down in the side of the nest and the position of the 'Cuckoo's' egg in relation to it—of such an attempt previous to the removal of the bird's own eggs."

Further, Mr. Swynnerton writes—

"I remember well that as a schoolboy in Ireland and England my main fear, justified by experience, was lest by visiting a nest too frequently or taking too many eggs I might make the bird desert. Here, in Africa, my fear is not so much the desertion of the eggs (though this sometimes occurs) as their disappearance, and the Kaffirs, in giving their reason for avoiding tampering with a nest with eggs, or placing a charm in it if they have touched an egg, always say, not that the bird will desert, but that it *will take its eggs away* ; cases are sometimes mentioned in which, as in the case I have myself mentioned, the bird was seen carrying its eggs away."

It will be remembered that when dealing with the thirteenth egg of Cuckoo A in 1920, I advanced reasons for supposing that the fosterer had removed one of her own eggs, deserting the nest before the Cuckoo deposited her egg therein. Later, there can be little doubt, this same fosterer removed one of her own eggs from the nest in which the Cuckoo deposited her twenty-first egg. This action is obviously one of resentment against visits of the Cuckoo, which the dupe probably associated, by prior experience, with the eventual loss of all her eggs. Doubtless it will be asked why the dupe should have been satisfied with the removal of one egg only, and did not return for the rest? The only answer to this seems to be that her resentment was appeased by taking away one, and she ceased to trouble further about those remaining, merely deserting them. It is a curious performance, but one which is likely to have come within the experience of most field-oologists, though probably their own interference, and not that of the Cuckoo, has been the cause of the bird's action. There are few who cannot recall instances of the discovery of incomplete clutches, and of then returning to find that not only had the eggs been deserted, but were short of the number

previously found in the nest. Probably this has been put down to some considerate collector who has contented himself with the abstraction of a single egg, but in at least many instances the abstraction has been the action of the bird itself.

My brother and I well recollect seeing a Shrike return to her nest of fresh eggs, which we had just found, and set to work to suck them ; and constantly, after finding Shrikes' nests with incomplete clutches, upon paying a subsequent visit we have found all the eggs gone and the interior of the nest "roughed up," this clearly having been done by the bird, the state of the hedge showing unmistakably that no one else had visited the nest.

In the record of my experiences of Cuckoo A in 1920, in each of the two cases when the Cuckoo remained beside the nest of the fosterer for ten and thirty-one minutes respectively, she was seen to leave the nest *without* an egg in her beak, contrary to what had been noticed on other days, when her visits to the nest of her fosterers had occupied a matter of seconds rather than minutes. And yet on immediately going to the nest we found that in exchange for her own egg left in the nest, the Cuckoo *had* removed one of the eggs of the fosterer, which had been counted in the nest

just prior to her visit, and there was no trace of the fosterer's missing egg near the nest, beside which the Cuckoo had remained for an exceptionally long time. The obvious conclusion is that she had swallowed the fosterer's egg. But what is so curious is that the only two occasions when the Cuckoo was seen to spend a long period by the nest was when the dupe's eggs were incubated. One is tempted to wonder whether the Cuckoo was aware of it and deliberately set out to cool the eggs and so check their incubation !

CHAPTER XV

THE YOUNG CUCKOO

THE generally accepted incubation period for the egg of the Cuckoo is twelve to thirteen days, and that is quite easy of proof. In at least many instances it may be even shorter than twelve days, for there is no doubt that many species of small birds can and do at times hatch their eggs in shorter periods than those usually given by the authorities, and in normal circumstances we find that, more often than not, the Cuckoo's egg is the first to hatch. By normal circumstances, I mean those in which the egg of the parasite starts on equal terms with the eggs of the dupe.

There has always been a speculation as to how the Cuckoo nearly always contrives to deposit her egg in nests in which incubation has not commenced. One theory was that she hesitated to drive a sitting bird off her eggs ; and quite an ingenious idea was that the Cuckoo took away one egg to test its condition. What really happens is of course

shown by my observations. At the sight of her dupes building, the Cuckoo "conceives" her egg, and she is ready to lay or deposit it in the chosen nest usually before the owner has commenced to incubate. In the case of our Meadow Pipit Cuckoos they picked up one of the rightful eggs as they went on to the nest, and held it in their bills whilst they laid. When the Cuckoo was disturbed after she picked up the egg and before she got on to the nest to lay,* she flew away only to return, in one case nearly two hours later, and then picked up a second egg of the fosterer as she again went to the nest. By picking up and holding the fosterer's egg whilst laying, the Cuckoo avoids the risk of carrying away by mistake her own egg.

When first hatched the Cuckoo is naked, blind, and an ugly squat-shaped little creature of fleshy hue. It is distinctly large for the size of the egg, which by the way is very thick-shelled.

The young Cuckoo, produced from an egg which we watched in 1921 for the purposes of the film, will well serve to illustrate the earlier salient points, as we had the youngster under close observation. On the evening of June 9 a Meadow Pipit's nest contained three eggs and one of a

* See Frontispiece.

Cuckoo. On the afternoon of June 20 the Cuckoo and two Pipits had hatched—it turned out that the Pipit's third egg was addled. Early on the morning of the 21st we found that the young Cuckoo was getting energetic and had already ejected the addled egg. Hawkins and I got into the hide and watched the Pipits brooding and feeding the restless young Cuckoo and its two nest-mates. It was very pretty to watch the male Pipit bring food whilst the female was brooding; she raised herself up and distinctly directed the distribution by the male of his burden of food. We were within four feet of the nest. We left at 4 p.m., and in our absence the young Cuckoo ejected his two nest-mates, which upon our return at 9.30 p.m. we found dying and stiff. I took them in my hands, breathed on them, and they gradually relaxed and came to life. One I risked by slipping it at dusk into the nest of a Meadow Pipit sitting on four eggs; the other was placed in flannel in a basket in an open oven. In the very early morning of June 22 they were both alive. We put them in with the young Cuckoo, and after Hawkins had taken several good pictures of the young parasite again ejecting them I transferred them to another nest which contained some newly hatched nestlings of

their own species. A remarkable feature, seen very clearly on the film, was that the young Cuckoo actually ejected the addled egg *whilst the female Meadow Pipit was on the nest*. She took no apparent notice ; on the contrary, it really looked as if she lifted herself up to allow the young Cuckoo more scope for his exertions.*

One of the spectators of the film has written to me—

“ Perhaps the scene which impressed me most was that of the ejection of the young Pipits by the newly-hatched Cuckoo. It was a glimpse into the appalling cruelties of the struggle for existence, the ‘ survival of the fittest ’ whose motto is ‘ Might is Right. ’ It offended, so to speak, every rule of fair play that appeals to one’s sporting instinct. The young interloper was obviously so much better equipped for the struggle, blind as he and his nest-fellows were, with his long unfledged flippers—like nothing so much as the pictures of the ‘ wings ’ of a pterodactyl—which he seemed to use as levers to raise and heave overboard the wretched young Pipits. He seemed to wriggle himself first to the bottom of the nest, and to emerge, by a series of jerks, bearing the young Pipit on the back of his neck, almost exactly as a

* See photograph, p. 214.

man delivering coals carries the sack. For the addled egg which he also jettisoned one could not feel the same sympathy. Most horrible of all, however, was the cold-blooded unconcern of the mother Pipit, whose attitude might have been expressed by her saying : ' Hurry up and get the job over, so that we can have a moment's peace ! ' ''

The young Cuckoo grows very fast. Within three days its skin has blackened, and shortly afterwards its feathers begin to sprout. It remains in the nest for some three weeks, and on leaving it is still fed by its foster parents often for a further three weeks.* Its appetite is insatiable, and the appearance of the nestling as it rises and falls in the nest, snapping with its gaping crimson mouth, is quite a terrifying one.

Amongst young Cuckoos there must be a high percentage of mortality ; those hatched in the nests of species building on or near the ground fall victims to prowling vermin, whilst those born in nests of Reed Warblers building in reeds growing in water frequently overbalance, and are found drowned beneath the nest.

The whereabouts of a fledgling Cuckoo are often betrayed by its continuous wheezing note,

* See photograph opposite.

YOUNG CUCKOO EJECTING MEADOW PIPIT'S EGG FROM UNDER
MEADOW PIPIT.

YOUNG CUCKOO, 20 DAYS OLD, RESENTING INTERFERENCE.

which is kept up incessantly whilst its fosterers are away foraging on its account. It will remain for hours together on one perch, and will take for itself any morsel that offers within easy range. That the young bird has been seen to hop down from its perch and capture a worm serves to show how not only those Cuckoos which have delayed their departure, but also those which return to find a scarcity of their normal insect diet, contrive to maintain themselves.

All practical ornithologists will have noticed that fosterers ordinarily make much more demonstration about a young Cuckoo than about their own legitimate offspring. It is just as if they took pride in the lustiness of their changeling, a pride which increases their excitability when danger threatens.

CHAPTER XVI

SUNDRY OBSERVATIONS: ON CALL NOTES AND FEEDING

CALL NOTES

THERE have always been discussion and disagreement on the various notes of Cuckoos. Several naturalists hold that the familiar "cuck-oo" call is used by both sexes, and also that the male can make use of the equally characteristic, but not so well-known, call of the female.

I am quite sure, from having constantly kept a daily watch on Cuckoos for the last four years, that the hen Cuckoo does *not* utter the "cuck-oo" note. Except on rare occasions it is impracticable to distinguish the sexes in the field by appearance alone, and the fact that more than one male is frequently in attendance upon the female adds to the difficulty of coming to a definite conclusion in the matter. But since ours was so close a watch we learnt to distinguish the female by her actions and habits, and at the end of the fourth season

I make with complete confidence the statement that it is the male alone which calls "cuck-oo."

Owing to the futility of attempting to express adequately the call or song of a bird in syllables, it is possible that when I have written "bubbling" for the female call, some readers may have thought of the "chuckle" of the male which might also be expressed by "bubbling." But the two calls do not really resemble one another. The call of the female is a sharp reel, not so remotely resembling the "hinny" of the Dabchick.

In moments of excitement the male produces two or more "cucks" to one "oo," and he has to express a variety of emotions on a limited vocabulary.

Besides her identifying call, the female utters a noise peculiar to herself when she is watching her destined fosterers. I have described this as "mewing." It is a low and fascinating murmur, and to become familiar with, or even to hear it, one needs to be very near a female when her attention is concentrated upon her dupes. In addition there is that which I termed "wah-wahing," usually uttered in flight.

Now when a male settles he usually calls

"cuck-oo," but it is the habit of the female to alight in silence. After laying she frequently "bubbles," much as the domestic hen "cackles" after a similar act. It is likely that her cry is then both an expression of relief at having safely deposited her egg and a solicitation of attendant males.

So far as my study of Cuckoos has gone, it is perfectly certain that only the female takes part in the watching of the fosterers, the finding of the nests, and the deposition of the eggs, for which purposes she separates herself from her attendant male or males. But when she has been over-long in the matter of laying, I have noticed that the male may apparently evince some concern. Other observers, notably G. J. Scholey, maintain that the male accompanies the female when she is on egg-laying bent, and renders her assistance by distracting the attentions of the intended fosterers. Possibly there is considerable variation in the habits of different Cuckoos in this as in other respects.

The male's familiar note is undoubtedly at times his song; at others, it serves to announce his whereabouts to the female.

FEEDING

An interesting fact, which will be apparent from our daily observations, is that certainly, on the days upon which she lays, from about midday until she has deposited her egg, the female Cuckoo does not concern herself at all about feeding. Despite the immense number of hours during which, for long consecutive periods in 1920, we had Cuckoos under observation, on no occasion did we see a mature Cuckoo feeding. But in 1921, on the second common, we did see them drop down, Stonechat fashion, and apparently pick up something.

The manner in which males and females would suddenly leave the common, flying right away, and then as suddenly reappear, would point to the conclusion that Cuckoos have their definite feeding times and places, and unlike so many birds, especially of the smaller species, are not constantly foraging throughout the day.

That the female Cuckoo habitually goes for many consecutive hours without thought of food is very evident from our experiences. And the manner in which she will call up her mates and then fly away, as a rule with one of them, would

also point to the conclusion that when the duty of egg-laying is over, a thoroughly good repast is sought.

Probably the favourite diet of Cuckoos is one of hairy caterpillars, notably those of the Drinker Moth. When these larvæ occur on the long grass beneath a fence—and where there is one there are sure to be plenty—several Cuckoos may be attracted to the place and range themselves along the fence. Here they will act as though they were large Chats, dropping down to take a caterpillar and returning to their perch. It is not easy at any time to meet with Cuckoos when they are feeding, and when one remembers the insatiable voracity of the young Cuckoo, one can hardly credit that he or she will grow into a seemingly abstemious bird. But it is likely that adult Cuckoos can and do speedily fill themselves to repletion, for they are almost the only birds who prey upon hirsute caterpillars, and so meet with no competition on their feeding-grounds.

It is a fact that young Cuckoos will eat worms, and one has even been seen to fly down on to a lawn and pull out a worm as a Thrush would do. If the young, why not the adults? And so it appears to be possible in an open season for

Cuckoos to prolong their stay successfully, when for some reason or other they have failed to emigrate at the usual time. Thus accounts of late-staying Cuckoos should not be hastily dismissed as improbable.

CHAPTER XVII

THEORIES AND CONCLUSIONS

THE fundamental Cuckoo problem—how and why her parasitic habit originated—is, of course, probably insoluble, and I have no intention of theorising about it. There are, nevertheless, a number of interesting side-issues to the main problem, on many of which I think our observations throw a little light ; and I expatiate on them the more readily in the hope of stimulating other enthusiasts to plan and carry out campaigns of observation which may contribute further evidence.

I only desire the reader constantly to bear in mind the *caveat* I have already entered, and to refrain from deducing a generalisation from the statement of a particular case. No student of natural history can afford to be blind to the infinite possibilities of variation—whether in appearance or in habits, whether due to permanent laws of nature working through the ages, or to temporary adaptation to environment and circumstance—that all

living creatures exhibit ; amongst which, birds, owing to their power of flight and the phenomena of migration, are peculiarly elusive and difficult to identify.

IDENTIFICATION OF CUCKOO FROM EGG

When one finds in a mud-lined nest blue eggs with black spots on the larger end, one does not hesitate until one has seen the parent bird to say, "This is a Song Thrush's nest." In the same way, readers of this book will have gathered, there is among practical students of the Cuckoo a consensus of opinion, amounting to a certainty no longer in need of proof, that *a particular hen Cuckoo may be identified from the appearance of her egg, within reasonable limits of time and place.* The limitations of time and place are mentioned, because if, for example, one found the same type of Cuckoo's egg being laid in the same territory, season after season for (say) twenty years, it would be *reasonable* to question whether a daughter had not succeeded to her mother's realm ; and if, again, one found in the same season, but in widely separated territories, the same type of Cuckoo's egg in the same species of fosterer's nest, it would be a *reasonable*

explanation that they were the eggs of two different Cuckoos, possibly related. On the other hand, such a high degree of variation exists amongst Cuckoos' eggs, that the odds are heavily against two Cuckoos laying, in the same area and in the same season, eggs which cannot be distinguished with ease.

For my part, I am confident, on the strength of the close observations recorded in this book—and I trust they will convey to my readers the same degree of confidence—that the several “clutches” of Cuckoos' eggs which I now possess were each laid by a separate individual hen Cuckoo, in many instances actually under my own eyes.

CUCKOO'S PREFERENCE IN SELECTION OF FOSTERER

The next conclusion which I consider is amply substantiated by the recent observations of other practical students of the Cuckoo, as well as by my own, is that *a dominant hen Cuckoo always selects for preference the same species of fosterer* as the recipient of her eggs. I say “for preference” because in my experience this rule is only broken when the Cuckoo, on one of her laying-days, is unable to find within her territory suitable accommodation in the nest of her regular fosterers.

I will return shortly to discuss further the reservations implied in the phrases "on one of her laying-days," "within her territory," and "suitable accommodation," each of which is intended to suggest a necessary condition.

We may unhesitatingly dismiss the idea—barely worthy of the name of theory, but not beyond the imaginative power of some naturalists—that a hen Cuckoo lays her egg on the ground, looks at it to see what it is like, and then careers about with it in her bill (or throat) in search of a nest, the eggs in which will resemble her own. There are variations of this pretty "guess at truth": in one version the Cuckoo is credited with the ability to impart to her egg the characteristics of the eggs of her prospective dupe. We know that she pays a visit to a nest in advance of laying in it: obviously (says our theorist), having thus gained a mental picture of her dupe's egg, she employs the period of intense concentration, which precedes laying, in imparting a similar character to her own unlaidd egg!

It is charitable to suppose that this theory was formulated in explanation of the discovery of two or three different types of Cuckoo's egg in the nests of one species in a comparatively small area.

Doubtless the real fact was that two or three Cuckoos were competing for the territory, no one of them having as yet acquired dominance. Our knowledge of the working of the pigmentary glands in a bird is incomplete, but we can be quite certain that no bird "by taking thought" can add to or alter the colour or markings of her egg.

A subsidiary theory arises, as a corollary to the aforesaid conclusion that a hen Cuckoo prefers to lay in the nests of a particular species of fosterer, and that is *that the given hen Cuckoo was herself fostered by a bird of that species*. This must strictly be regarded at present as a theory, on account of the absence of indisputable proof. Such proof can only be obtained, so far as one can see, by some system of marking in one season a young hen Cuckoo, known to have been reared by a particular species of foster-parent, and of subsequently observing the same hen Cuckoo, when mature, returning to victimise the same species of fosterer. This is "a consummation devoutly to be wished," despite the almost insuperable difficulties that will be obvious to any naturalist; but at the same time, lacking such direct proof, it will doubtless be agreed that there is a strong *prima facie* probability in the theory.

Picture a female Cuckoo, bred last season in a Meadow Pipit's nest in England, returning for her first annual visit to the country of her birth, with her inherited parasitic instincts fully developed. What species of fosterer is likely to be most attractive to her? Surely that to which belongs the individual pair that brought her up in the previous season. Is it not indeed possible—even probable—that, for her first breeding season at any rate, she should not only return to the familiar surroundings in which she was bred, and seek to billet her offspring on the species of dupe with which she is most at home, but even try to victimise the identical pair of birds which fostered her herself?

CONDITIONS FAVOURABLE TO REGULARITY OF LAYING

I may now conveniently discuss the reservations I made above in stating the conditions under which, in my experience, a Cuckoo tends to break her rule of laying in nests of the same species of fosterer.

I have been asked why I attached so much importance to trying to ascertain whether Cuckoo A actually did lay an egg on the days when she should

normally have laid (*i.e.* one after the sixteenth egg in 1920, another after the fifth, and the third after the tenth eggs in 1921), but on which we did not see her lay and therefore did not know whether she laid or not. My answer is that I regarded it as a most valuable point to endeavour to establish whether she had laid or not, because if we could show that she did *not* lay, it would naturally lead to the inquiry *why* did she not lay.

On each of the three "laying-days" just mentioned there was suitable accommodation within her territory: in other words, there was, on the common where she laid all her sixty-one eggs, a nest (hitherto unused) of her natural fosterers containing one or more Meadow Pipit's eggs, unincubated, and therefore available. Why, then, did she not lay on these days? I contend that the explanation lies in the fact that a few days prior to each of the "laying-days" the Cuckoo foresaw a threatened insufficiency of prospective foster birds' nests, and that this anticipated shortage of accommodation inhibited her laying. Owing to our system of continually stimulating the rebuilding by her natural foster birds, she soon resumed her normal regularity of laying.

Particularly significant, in this connection, is

the fact that the only two occasions—in 1920 and 1921—when the Cuckoo laid in a nest other than that of a Meadow Pipit, were also the only two of her “laying-days” in those two seasons on which there was no suitable accommodation within her territory, *i.e.* no Meadow Pipit’s nest, with eggs unincubated, on the common. To my mind this is one of the most valuable discoveries of the whole inquiry, as it suggests that a dominant Cuckoo, even at the expense of being compelled to forsake her regular foster birds, prefers to lay within the confines of her own territory, rather than seek further afield for suitable nests of her regular fosterers. Territory, in short, takes precedence over foster bird.

Moreover, this discovery and the theory of dominance seem to me to be mutually corroborative. A dominant Cuckoo, mistress of her own territory after (presumably) a struggle with competitors, prefers to remain on her own ground and dupe a bird of some species other than her usual foster birds, because she knows—I think one may legitimately say—that if she begins to wander she will soon come into conflict with another hen Cuckoo dominant over another territory.

THE LAW OF SURVIVAL, AND SIMILARITY IN EGGS

The application of the law of survival provides a reasonable explanation of one or two other phenomena of the Cuckoo problem. Why, for instance, do we never find a Cuckoo laying more than one egg in a given nest? This is surely answered by a *reductio ad absurdum* : suppose two eggs of the same Cuckoo laid in the same nest—what happens when the first of them is hatched? The young Cuckoo's first instinctive action, as we know, is to eject all the other contents of the nest, and so overboard goes his brother or sister ! Thus a Cuckoo which produced in a season (say) ten eggs, laying pairs in five different nests, would at best have only five of her progeny reared.

Why, again, does the Cuckoo lay her egg with such astonishing rapidity? Our discoveries reveal for the first time that on the one hand the Cuckoo is capable of retaining her egg for hours after she has become anxious to lay it, and on the other that, as soon as occasion favours her, she can carry out the whole process in eight seconds. Obviously, the more quickly she lays, the less chance she gives of detection, and the less likelihood there is of the foster bird forsaking after her visit. In this way

rapidity in carrying out the actual parasitic function has become a condition of success.

It may have puzzled many observers, as it always puzzled me, to find a reason why the Cuckoo lays an egg so small in proportion to her own size. Here, again, the proved fact that she frequently has to await a favourable opportunity for the actual deposit of her egg supplies the answer, for it is clear that the smaller the egg compared to the bird's size, the more easily can she retain it even when it is ready to be laid.

Another facet of the Cuckoo problem that seems to me to be illuminated by the law of the survival of the fittest, necessitates a brief consideration of the similarity between eggs. In my own collection of hundreds of Cuckoos' eggs, taken from the nests of several species of foster-bird, I can show Hedge-sparrow Cuckoo's eggs with a tendency to bluish-green in the ground colour and faint surface-markings; Meadow Pipit Cuckoo's eggs with all the superficial characteristics of Meadow Pipit's eggs; Wagtail Cuckoo's eggs with that generally grey appearance typical of Wagtail's eggs; and Robin Cuckoo's eggs exhibiting a reddish tinge. I am confident that other practical observers and collectors will agree that this is

frequently the case, although they may be as aware as I am of the exceptions, often found, which prove the rule. Side by side with this fact we have to place the obvious truth, that the less the contrast in appearance between the egg of a Cuckoo and the egg or eggs of the fosterer beside which it is laid, the better chance the Cuckoo's egg has of being accepted, brooded, and hatched, by the fosterer.

Both facts clearly point to the same conclusion, *i.e.* that successful mimicry in her eggs is a condition of survival for the Cuckoo. For her it is the counsel of perfection to lay, rapidly and without detection, in the nest of one of her regular fosterers, an egg of such appearance as does not cause the foster-parents to desert. In observed cases where she has failed to achieve this ideal, a simple explanation is to hand. For example, one may come across an obviously reddish Cuckoo's egg, eminently suitable, in the eye of an expert, for a Robin's nest, but laid alongside the blue eggs of a Hedge-sparrow. This condition of affairs, however, is in my opinion the result of some irregularity in the even tenor of the Cuckoo's normal routine. It cannot be doubted that this reddish egg is no accidental variation laid by a Cuckoo which usually lays eggs of a green or grey

type, but is the egg of a Robin Cuckoo insufficiently dominant to secure an ideal depository, or perhaps of a dominant Robin Cuckoo diverted by some accident from her normal prey. Whatever the cause, the result is clearly that an egg conspicuously different from the foster bird's eggs runs a greater risk of causing desertion, and so failing to achieve the object for which it was laid, than does an egg which resembles them.

If we postulate the truth of the theory, which for my part I confidently hold, that a female Cuckoo bred in (say) a Robin's nest is not only herself the descendant on the maternal side of generations of Robin Cuckoos, but has an inherited instinct to seek out Robins' nests and make Robins, so to speak, her preferential victims, it ceases to surprise us that the respective eggs of Robin and Robin Cuckoo should exhibit a marked similarity. What has been the law of the survival of the fittest, from the Cuckoo's point of view, throughout the ages of evolution, is thus dovetailed with the line of least resistance on the part of the Robin.

But I frankly admit that this theory must fall to the ground, if it is a fact that the influence of the male parent-bird is at least as potent, if not more so, as that of the female parent on the off-

spring—and even on the eggs—produced by their daughter. Yet again, it may prove to be the fact that the male Cuckoo tends to associate only with female Cuckoos of his own type, *i.e.* those reared by the same species of fosterer. This idea may some day turn out to be less fanciful than it sounds—that there is at present an unknown but nevertheless definite distinction between the different types of Cuckoo, according to the foster-parents by which they were bred and to which they are attracted.

THE MATING OF CUCKOOS

Writer after writer, in dealing with the Cuckoo, has stated that the Cuckoo is polyandrous, *i.e.* that, instead of pairing whether permanently or for the season, each hen Cuckoo is attended by a number of males. As far as I know, the statement has barely been questioned, and no doubt derives from the independent statement that male Cuckoos outnumber the females. This in its turn is no doubt the result of a rash deduction from observation. Certainly the male Cuckoo makes himself widely known by incessant announcements of his name—"In May he sings all day"; and not improbably nine-tenths of my readers have never knowingly either seen or heard a female

Cuckoo. But to argue from such observations that there are more males than females is false logic.

I do not pretend to have enough evidence to prove or disprove the statement ; but I contribute an observation of my own which may be significant. In the season of 1921 there were proved to be at least nine female Cuckoos laying along the direct line between my original common, the territory of Cuckoo A, and the second one which is dealt with in Chap. IX, a distance of some three miles. Some of these hen Cuckoos were parasitic upon Hedge-sparrows, and possibly other species. Yet a male Cuckoo, which we were able to identify unmistakably by a peculiarity in his voice, regularly traversed the whole distance and appeared to be equally at home at one end as at the other.

Do the males outnumber the females ? Is the Cuckoo polyandrous ? If so—if a hen has several male partners—are they all members of the same type of Cuckoo ? Such questions may be multiplied endlessly. My own impression—I will not put it higher—is that the Cuckoo is probably promiscuous, *i.e.* both polyandrous and polygamous. I see no reason to assume that one sex outnumbers the other, and the balance of evidence is against

Cuckoos pairing as most birds do. There is no necessity for birds to pair, in the usual sense of the word, when they do not tend their young ; and if we may adduce the sociologist's dictum, that promiscuity tends to the extinction of the family, is it fanciful to reverse cause and effect, and suggest that absence of the family is an incentive to promiscuity ?

CONCLUSION

I shall be well repaid for the labour involved in compiling this book if it leads other students of the Cuckoo to verify for themselves such main facts as are brought forward for the first time, and to make and record observations which will either confirm or disprove the theories that I have formulated. To this end I shall be pleased to make the acquaintance of and to show my collection of eggs to those who care to co-operate with me in the solution of more of these fascinating problems which a study of the Cuckoo reveals.

In the main I feel that my deductions are in essence correct, for I have found that many of those ornithologists who have the widest practical experience of the Cuckoo are largely in agreement with

my expressed opinions which, backed by the long and detailed observation upon Cuckoo A, appear to have solved some of the problems which have enshrouded the Cuckoo, and in so doing have laid bare at least the major portion of the Cuckoo's secret.

APPENDIX

WEIGHTS OF CUCKOO A's EGGS

I AM indebted to Mr. P. F. Bunyard of Croydon for the kind trouble he has taken to weigh accurately the empty shells of each of the 61 eggs collected from Cuckoo A during the four seasons 1918-1921. The weights, given below, for 1920 and 1921 have, perhaps, the greater scientific interest, as we know that the whole of the eggs laid in those two seasons are included, that each was fresh when taken, and there is no doubt whatever as to the order in which they were laid.

Attention may be drawn to a few interesting points:—

(i) The first egg laid in each of the seasons 1920 and 1921 is considerably the lightest of its series.

(ii) The last eggs laid in the years 1919 and 1920, when the Cuckoo was encouraged to lay to the extreme limit of her powers, show a striking drop in weight in comparison with the eggs laid immediately before. The last egg of 1919 was 14 milligrammes lighter than the last but one; the last of 1920 15 milligrammes lighter.

(iii) This fact is the more interesting when contrasted with the fact that in 1921, when the Cuckoo was, according to my theory, discouraged from laying as many as she could have laid if further "natural fosterer" provision had been made for her, the last egg laid was actually heavier than that season's average (196.6 milligrammes), and very little lighter than its immediate predecessors.

As a contrast, and in illustration of the degree of variability possible in the size and weight of Cuckoos' eggs, apart from questions of colour and markings, it is striking to note that the average weight of the Reed Warbler Cuckoo series of 19 eggs taken by Mr. G. J. Scholey in 1921 was 247·6 milligrammes.

WEIGHTS OF CUCKOO A's EGGS, 1920-1,
IN MILLIGRAMMES

No.	1920	1921
1.	177	178
2.	186	193
3.	182	190
4.	186	193
5.	181	188
6.	194	197
7.	194	198
8.	194	206
9.	198	202
10.	202	200
11.	197	201
12.	209	204
13.	203	202
14.	200	200
15.	205	198
16.	200	
17.	200	
18.	207	
19.	208	
20.	200	
21.	185	

1918	...	9	Eggs average	195·3	milligrammes
1919	...	16	" "	191	"
1920	...	21	" "	195·6	"
1921	...	15	" "	196·6	"

PRINTED IN GREAT BRITAIN
BY WILLIAM CLOWES AND SONS, LIMITED,
LONDON AND BECCLES.

Date Due

MAR 7 1985	DEC 1 1985		
APR 1 1985	MAY 1 1985		
JUL 07 1985			
NOV 08 1985			
MAY 29 1986			
PRINTED IN U. S. A.		CAT. NO. 23233	

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