

THE CONTROL OF PARASITES TONY COOKE DISCUSSES THE USE OF PESTICIDES

FROM time to time the topic of parasites and their control comes up either in discussion or in the columns of *FUR AND FEATHER*. Various people have differing ideas on how to cope with 'wee beasties' but as I work in the pesticide trade I thought it a good idea to gather most of the facts together to allow people to judge for themselves. As I am not a biologist by calling I shall not attempt to identify the various parasites, but simply describe 'chemical' treatments for the external ones.

The first consideration is, and must be, safety to the mice. There is no point in using an insecticide which has a high mammalian toxicity. There are three main ways in which a chemical can enter the body and do harm:

- 1 Ingestion (ie by eating the stuff).
- 2 Inhalation (ie by breathing in the vapour).
- 3 Skin absorption.

ITEM 1 is measured in units known as LD50 (this is the quantity of chemical, per unit of body weight, which will kill 50% of test animals in twenty-four hours) and the lower the figure the more poisonous the chemical is.

I shall quote figures later in the article for the main chemicals—plus comparisons with other well known products.

ITEMS 2 AND 3 are rather less easy to define and I have not been able to produce any actual figures—so you will have to accept my assessment of the chemicals based on my experience. The difference is, of course, that whilst almost

anything can kill (even table salt), if eaten in sufficient quantity, only certain chemicals are capable of entering the body through the skin or have any vapour action.

The main ones which exhibit these properties are organo-phosphorous chemicals such as malathion and dichlorovos. Some chemicals have the disadvantage that they can accumulate inside the body (such as DDT) or their effect on the body is cumulative over a period (such as the organo-phosphorous compounds) and some (such as pyrethrins and lindane) are free from these disadvantages and pass straight through the body.

I have compiled a table listing a few facts and figures (see top of next column):

Now to discuss the facts shown in the table. You may say, no problem, we'll use the 'natural' product—the pyrethrins. But things are never that simple. Pyrethrins suffer from two major disadvantages. First they are not stable—they are oxidised and decomposed in contact with air—so unless you know that your supply is 'fresh' you can't be certain just how active it is. Secondly they can cause severe allergic dermatitis. This does not happen

Chemical	Discovered by	LD50 (in mg per kg)
Pyrethrins	Used for 100 years, extracted from specially grown flowers of the chrysanthemum family	1200
DDT	Geigy (Switzerland) in 1940	113
Lindane (or gamma-BHC)	ICI (UK) in 1940	150
Malathion	Cyanamid (US) in 1951	1800
Dichlorovos (or DDVP)	Shell (UK) in 1960	70
Codeine phosphate	(as in 'headache' pills)	100
Nicotine	(as in 'fags')	55
Sodium cyanide		2

with all individuals but could affect either you or your stock.

Moving on to the next pair of chemicals (both organo-chlorine products) DDT and lindane. DDT is, of course, already a 'dirty' household word. It's main disadvantage is that it can accumulate in the body-fat. Lindane does not suffer from this. Both are moderately toxic to mammals—but bear in mind that ingestion is the only problem and they do not operate through the skin or vapour.

Finally, the two organo-phosphorous chemicals, malathion and dichlorovos. Malathion is not entirely stable and does decompose. It can be absorbed through the skin and is rather smelly to use. Dichlorovos you will not meet as a dusting powder because it is too toxic in the vapour. Shell gave some

considerable thought to this and finally produced their 'Vapona' strip. Basically the chemical is impregnated into a resin slab so that it is released only very slowly. I personally had some reservations as to the effects of the vapour on mice but having heard of other fanciers who have had Vapona strips in their sheds for more than a year without any ill effects I have now started using it myself.

One point to note about the dusting powders is that none of them kills eggs—only adult insects. So when dusting mice do repeat the treatment about two to three weeks later to catch those that have hatched out subsequently.

One other thing: insects have been known to develop resistance to a particular chemical with continuous usage, so just occasionally ring the changes. We use a lindane (gamma-BHC) dusting powder most of the time, but about once a year we get in either malathion or pyrethrins. However 'safe' the claims are on the label do not use on babies until they are at least four weeks old and then only sparingly.

One final very important point. Although this article applies equally to most small mammals (eg mice, rats, rabbits, etc) it is important to note that it does not apply to birds. Cage birds, poultry or pigeon fanciers (and fish enthusiasts) should note that many chemicals have totally different toxic effects on their species and they should therefore be warned against trying them without expert advice.

REPORTS FROM THE CALDER VALLEY

Mr A Kettle's classes

With a total entry of approximately 580, the show was a good success. I thank all exhibitors who sent under me, there was some very good stock on show. I also thank the ladies for the very nice lunch, and my young boisterous, but efficient stewards, Messrs Macskerill, Webster and Pickering. Best in show was a self black by Jack Wormald, best opposite age a black tan from Ernie Higgs, best self, Wormald black, best Tan, Higgs Dove tan. Best marked, Heywood broken, best AOV, Smith argente.

TAN CHAM/SILVER Ad 5: 1 Espley silver doe, good top colour and tan, sore back feet, lacks condition 2 Higgs, silver buck, a little light on top colour, good tan, slight bar of white hairs on feet held it back, otherwise it would have won 3 Lindsay, silver, good top colour, size and type, but lacks tan r Fleming much too dark almost like a dove. The only cham in this class was sent off it was covered in fleas, I had it put straight back in the travelling box, as this was unfair to exhibitors who attempt to keep their stock free from lice etc 8 wk 5: 1 3 Espley, silver doe, good top colour and tan, I gave this mouse the benefit of the doubt it was well up to age 3 silver buck again good top colour but not the finish or strength of tan as winner 2 Maynard, silver buck, good top colour but lacks tan r Marriotts, cham, fair top colour, no pinky tinge in coat, fair tan, excelled in condition **BLACK** Ad 8: 1 Higgs, black buck, massive

size, good type, strong tan, very good top colour 2 Heywood, doe, good top colour and tan, white toenails held this one back 3 Evans, doe, small, good top colour, lacks tan of winners r Clifton, a good buck but failed a little tan **BLUE** 4: My worst class for quality 1 Cooper, buck, fair top, poor tan, small for an adult 2 Heywood, top colour too dark but stronger tan than winner 3 r pet shop mice, one doe was in kindle **AOV** Ad 7: 1 2 r Higgs, 1, dove buck wonderful colour the ideal shade a nice depth of tan, a good win, my nomination for best in show 2 another good dove buck, a little darker than winner r dove doe, not the condition of the others 3 Lindsay, chocolate doe, good size but a little on the fat side, good top colour, fair tan, quite a good try 8 wk 9: 1 3 Higgs, black buck, wonderful mouse, good top and excellent tan, good feet and wonderful condition, won best opposite age to best in show 2 Heywood, black doe, again another good mouse but not the tan of the winner 3 another black doe another good mouse, but lacks tan r Evans, a dove doe, wonderful top colour but badly fails tan **AC** Chall ad 23: 1 2 3 r Higgs, winning dove 2 dove 3 winning black r 2nd black 8 wk 13: 1 3 Higgs, black 2 Heywood, silver 3 black r Evans, black **DUTCH** Ad 5: 1 2 Cound, cinnamon buck, good head and blaze and undercut saddle slipping a little, good stops 2 cinnamon buck, another good buck, good head but slips on left jowl, good stops but slips on saddle and undercut 3 Maynard, agouti buck, good blaze but cheek markings running under

jowls, saddle slips and undercut ragged r Pickering, choc buck, good head and stops but poor saddle and undercut 8 wk 4: 1 2 Maynard, agouti doe, very good head and saddle, fair undercut but poor stops 2 argente doe, good head and undercut but saddle slips and odd stops 3 Espley, much too heavy on head and poor undercut **AOV MARKED** Ad 8: 1 Heywood, eight spot black Broken doe, excellently placed spots, no brindling here, best Marked and nominated for best in show 2 Maynard, seven spot black Broken doe, another very good mouse, close to winner 3 Clifton, seven spot black Broken buck, another good mouse, hard lines to meet other two r Mackerill, Himalayan doe, the best of the Himalayans today, failed moult on head and body colour too creamy 8 wk 9: 1 Brown, nine spot black Broken die, another very good mouse, not quite finish of adult winner, ran it close for best Marked, good well placed spots, no brindling 2 Barker, five spot black Broken buck, could do with a few more spots but what it had were clear and well placed, again no brindling 3 Heywood, Himalayan buck, good size and type but poor body colour and points r Cound, nine spot black Broken, fails condition and colour to winners **AV MARKED** Chall ad: 1 Heywood, Broken 2 Maynard, Broken 3 Cound, Dutch r Clifton, Broken 8 wk: 1 Brown, Broken 2 Barker, Broken 3 Maynard, Dutch r Maynard, Dutch **AV Breeders** ad 30: 1 Wormald, black 2 Watson, Champagne 3 Smith, Argente r Higgs, dove Tan 8 wk: 1 Higgs, black Tan 2 Smith, Argente 3 Brown, black Broken r

Espley, silver Tan Doe ad 16: 1 Wormald 2 Watson, Champagne 3 Heywood, Argente r Smith, black Broken 8 wk 12: 1 Bakes, Champagne 2 Brown, Broken 3 Higgs, black Tan r Halletts, Champagne Cup 29: Smith, Argente Gift class 14: 1 Maynard, Dutch 2 Holmlea Stud, Champagne 3 Goodstock, Chinchilla r Maynard, silver Tan Grand chall ad: 1 Wormald, Black 2 Watson, Champagne 3 Smith, Argente r Higgs, dove Tan 8 wk: 1 Higgs, black Tan 2 Hartley, Agouti 3 Smith, Argente r Kellett, Pearl. ANTHONY T KETTLE

Mr C Beckett's classes

WHITE or CREAM Ad 7: 1 Halletts, PE White, good size and type, fair on colour and light moult across back 2 Pearce, BE White, good colour top and under, little bare on face just get them a bit bigger and you'll be there 3 Cooper, BE Cream, pale shade top, fair on type, thin under r Goodstock, PE White, fails colour top and under, nice type, size, but rough in coat 8 wk 18: 1 Halletts, PE White, good colour top and under, nice head, could be a little stronger on tail 2 Goodstock, BE Cream, good level top, just a shade too dark, nice type, lovely condition 3 Pearce, BE White, lovely colour top and under, a little bare on face, nice type, good condition r Hartley, Cream, nice shade top, fails a little under, could be better type and condition. The light was very bad while judging and made things very awkward, one or two could have changed places later in the day when the light improved **BLACK or BLUE** Ad 5: 1 3 r Wormald, Black, good dense colour top and under, excels on feet, nice type, lovely condition, wins best in show. Congratulations Jack quite a while since you had a best in show 2 E Longbottom, Black, good top, under fails a little on feet, nice condition 3 r both Black, leader had the better under, good tops, fails feet 8 wk 7: 1 3 Higgs,

Black, dense top, good under, good on feet, fails a little on ears up to age 2 Pearce, Blue, nice medium shade top, good under, fails a little on feet, nice condition 3 Black, good top colour, bit thin under, feet a little light r Wormald, Black, fair top and under, fails feet **CHAM or FAWN** Ad 15: Good class. All Chams. 1 2 3 Watson, a smashing team all had really good colour on top, lovely type and condition, only minor points separated them, leaders only fault which held it back in Grand class was a shade light on tail root, second failed a little on flanks, these were too loose, third had a slight moult mark on face, three excellent mice r Hallett, good level top and under, but just a shade to dark 8 wk 13: 1 3 Bakes, both Chams, lovely shade, tops good under, nice type, excellent condition, leader had the best ears 2 Hallett, Cham, good level top, again a shade dark, good under and type r Hartley, Fawn, nice colour, under not quite finished on top, should make up well. It seems that our juveniles have taken over in the Cham classes, and are doing a good job of it, these were my best classes and only minor points held them back from higher placings in Grand class etc. Congratulations lads keep it up and before long you are bound to get the top awards. **AOC SELF** Ad 5: 1 Hartley, Red, good colour top and under, spoilt by faint moult mark on flanks 2 Pearce, Red, nice top, fair under, fails a little on ears, bit fat 3 Longbottom, Choc, nice top, fails under, very open in coat r Goodstock, Silver, good big mouse, nice shade, but very rough at time of judging 8 wk 4: 1 Pearce, Red buck, nice colour top and under, wants another couple of weeks it should improve 2 Lindsay, Red, good top, shade lighter under, fails a little on feet to leader 3 Beach, Choc, not dark enough top, fails under r E Longbottom, Choc, only fair top and under. Chocs have fallen right off this last year or so **AC SELF** Chall Ad 21: 1 Wormald Black 2 Watson, Cham 3 Hartley, Red r E Longbottom Black 8 wk 28: 1 Bakes, Cham 2 Higgs, Black 3 r Hallett, PE White, Cham. Many thanks to my stewards Mrs Hallett and Miss A Heap, who did a good job, also to the ladies and the back room boys without these the shows would not run half as smooth. **C BECKETT**

EAST MIDLANDS SHOW

Mr E Higgs's classes

The East Midland Mouse Club through the efforts of Tony Kettle ran an open show on December 12. It reminded me of the days when the late C H Johnson ran these kind of shows. An entry of around 500 was quite good as it was so near to Christmas.

I thank all who supported this show and to those that did not win, competition was quite keen, but please look out for those fleas, this always spoils the chance of a good mouse.

I feel sure paper tissue is far better than hay in one's show cage provided the mouse in question is free from fleas on the particular show day.

I would like to thank John Webster, my mouse steward and also John Mackerill, my book steward who took all notes of each particular mouse.

These two young fanciers are a credit to the Fancy. I was rather surprised of the faults they saw on some of the mice even to the smallest detail. They are both only sixteen years of age, but I can assure you they will be judges of the future, I have never met anyone so keen. In fact at times I was beginning to wonder if I was the judge?

I congratulate Tony Kettle on winning best in show again with the dove Tan which also won at London and Airedale, and a special thank you to the ladies for the cups of tea.

WHITE or CREAM Ad 4: 1 Mackerill, PE White doe, young adult, good head eye and ears, with good type and condition, nice colour 2 Hallett's doe, lovely type and condition, showing a line on under, close to winner 3 Conette, BE White doe, good head, eye, fair colour, lacks sparkle 4 Reice, PE White buck, fails condition and small piece out of ear. Whites are losing size of a few months ago 8 wks 8: 1 Cooke, PE White doe, good top and under, nice eye, head and ears, best of all the whites for colour, in good fettle 2 3 Holmlea Stud. BE Cream doe, nice level top and under, not as fit as above 3 PE White doe, nice all round mouse, good type, not quite the colour 4 Montgomery, PE White buck, fails under, pity you did not show the doe **BLACK or BLUE** Ad 5: 1 4 Wormald, Black doe, young adult, level top and under, nice condition to be a little critical could be a shade darker feet, still a good mouse, I saw no signs of any white toe nails or white hairs in any of the blacks 2 Berry, blue, doe, best of the blues, nice shade top, level under feet, could be better 3 Evans, Black buck, largest mouse in class, good top and under, fails tan vent 4 Black doe, fails under 8 wks 5: 1 Berry, blue buck, level all round, lovely condition, a really good baby 2 Evans, Black doe, nice top and under, condition good but not the type of winner 3 Reice, Blue buck, lovely condition but failed

under to the above two 4 Wormald, Black doe, poor under **CHAM or FAWN** Ad 6: 1 2 3 Hallett's, Chams, a good team, little separated them, my shade of top colour, showing the pinky tinge, three nice does in lovely condition 4 Watson, Cham doe, a shade lighter, nice type and condition 8 wks 2: 1 Watson, Cham doe, good type condition, shade on the light side 2 Towers Cham doe, good head and eye, fails type **AOC SELF** Ad 8: 1 Holmlea Stud, Silver doe, large mouse, could be better colour, on the fat side 2 Shaw, Chocolate buck, good colour, too much loose flesh on under, also white hairs 3 Lindsay, Red buck, fair top and under 4 C Smith, same remarks. A poor class 8 wks 8: 1 3 4 Shaw, Chocolate doe, good top and under, nice head and eye, in excellent condition, a good one, my best Self Mouse, congratulations, not entered in grand challenge 2 Holmlea Stud, Dove doe, good top and under, best I have seen for a while, but well up to age 3 4 tops good, fail under **AC SELF** Ad 18: 1 Wormald 2 Hallett's 3 Holmlea Stud 4 Mackerill 8 wks 21: 1 Shaw 2 Berry 3 Cooke 4 Watson **BLACK or CHOC** Ad 7: 1 4 Holmlea Stud, black buck, good top, tan, type, lovely condition, could be better feet 2 Lindsay, choc buck, nice colour, top and under shade rough piece out of one ear 3 Heywoods, good top, not the tan of winner, tan behind ears, feet better 4 black, fails tan and feet 8 wks 6: 1 Lindsay, choc doe, nice top and tan, lovely type, good head and eye, my best 8 wks Tan all the way from Scotland 2 3 4 Holmlea Stud, blacks, little separated these three nice mice but up against it on the day **CHAM or SILVER** Ad 7: 1 4 Holmlea Stud, silver buck, good top and tan, big boned mouse, good condition 2 Lindsay, another good mouse with grand type, shade darker top 3 Espley, silver doe, again darker top, tan patchy, fails type 4 Silver buck, tan not level, also minor faults 8 wks 12: 1 4 Holmlea Stud, silver doe, grand top and tan, nice head and ears, nice condition, fails type, said to be the Portsmouth best Tan mouse this fancier seems to make a habit of winning with some very good mice 2 Espley Silver buck, good condition mouse, nice top, not so good tan also fails type 3 Heywood, cham buck, best of the chams, nice top colour, but lacks tan 4 silver buck, nice top and Tan, well up to age in my opinion **BLUE** Ad 7: 1 2 Holmlea Stud, doe and buck, stood out on their own, good tops and tan 3 Smith, doe, fails top and tan 4 Evans, same remarks 8 wks 7: 1 3 4 Holmlea Stud, little separated these three only minor points 2 Webster, only a baby, nice top, should improve with age **AOC** Ad 8: 1 2 3 Holmlea Stud, winner went on to win best in show, all three doves, in wonderful condition, tan was the deciding point 4 C Smith, Agouti Tan, nice top, fails tan 8 wks 8: 1 2 3 Holmlea Stud, Doves, all good tops and nice tan, minor points separated them 4 Espley, Dove, shade in moult, nice tan, well up to age **AC** Chall ad 19: 1 2 3 4 Holmlea Stud, Dove, Silver, Black, Blue 8 wks 25: 1 Lindsay, Choc 2 3 4 Holmlea Stud, Dove, Silver, Blue **AV** Members ad 20: 1 Holmlea Stud, Dove Tan 2 Bowers, Chin 3 C Smith, Agouti 4 Lindsay, choc Tan 8 wks 24: 1 Heywood, Fox 2 Lindsay, choc Tan 3 Shaw, Choc 4 Holmlea Stud, dove Tan Doe 8 wks 22: 1 Lindsay, choc Tan 2 Cooke, Dutch 3 Holmlea Stud, Dove Tan 4 Holmlea Stud, blue Tan Cup class 12: 1 Holmlea Stud, dove Tan, Best Self Mr Shaw, best opposite age J Wormald best Tan Holmlea Stud, best opposite age, A Lindsay. **ERNIE HIGGS**

RATS COULD BE POPULAR

AFTER reading the results of the Central England Mouse Club show held on November 21 I was quite pleased to see the number of entries in the rat classes. As I am a rat fancier I would like to see these delightful animals much more often on the show table.

However it must have been quite a sight to see all those rats alongside the mice at Solihull. I still hate myself for not going instead of sending my stock by rail. I hope that the rat fanciers who did not get in the cards at Solihull don't give up breeding and exhibiting for the sake of the rat as a show exhibit.

The British Rat and Gerbil Society which is being formed with the aid of Fred Beach is just the first step for the rat to become just as popular as the mouse on the show table. I think it will be a long time before we see a tabel full of Gerbils which will conform to the standard which I believe has been formed. I do not think that the gerbil has any place in the Fancy except in a pet class.

Coming back to the rat as an exhibit. When the society becomes fully formed, perhaps some rat fanciers can get together and begin to improve some varieties. I feel that the Japanese hooded variety needs a lot of improvement and I find that the marking running down the back of the rat from the hood is too wide and often broken.

If any rat fancier feels this drop me a line because as well as being interested in the way other fanciers breed and try to get rid of these faults I would try to help from the results I have been getting in my varieties of hooded's. **STEVE PUGSLEY**, 37 Calabria Road, Highbury, London N5.

THE JUDGES FOR 'BRADFORD'

Stuart Smith's NMC Notes

THE 1971 show season begins as usual with Bradford-at-Harrogate. The mouse section is in the capable hands of John Kellett, aided by myself and the usual helpers.

As always we have considered the schedule and judges very carefully and we have provided an extensive schedule and five capable judges.

Judging the **Self** section will be **Bill Shields** of Cumberland. Well known in the past for his fine stud of Fawns, he is now beginning to assert himself at the judging table.

The **Tan** section will be judged by local Yorkshire lad **Harry Jowett**, well known for several years as a Tan judge.

Sorting out the **Marked** section will be **Tony Holland**, all the way from the Smoke. He will be looking forward to a large entry, so do not disappoint him.

The **AOV** section judge will be our own glamour girl, **Doreen Cooper**, one of our respected AOV judges and, of course, originator of the Siamese mouse.

Best in Show judge is **A L Edmondson**, life member and past president of the National Mouse Club. Well known for many years as judge and exhibitor.

Now you know who the judges are, you have past experience of the efficient organisation that is Bradford-at-Harrogate, so please support to

the best of your ability. Let the first show of 1971 be the first of many high entry shows in the forthcoming year.

NEW MEMBERS

P Cunliffe (adult), 37 Bispham Avenue, Brightmet, Bolton, Lancs.
Dylan Davies (juvenile), Neveer, Newport, Pembrokeshire, South Wales.

Margaret Hodgkinson (juvenile) 3 Melchbourne Villas, West Hoathly, Sussex.
Adele Honeybone (juvenile), 27 Kellerton Road, Lewisham SE13.

Martin Hughes (juvenile), 13 Kendal Drive, Slough, Bucks.

Ann Sofia Johnsson, Bot 91, S-280, 72 Killeberg, Sweden.

Phillip Pearce (juvenile), 8 Chard Road, Axminster, Devon.

Allison Truffitt, 73 Highbury, New Park, London.

SUBSCRIPTIONS

I am now open to receive subscriptions for 1971, as usual they are due by January 31 so send them now, don't wait until the last minute.

As a reminder the new subscription rates are: 10s adults, 15s adult partnerships, 5s juvenile and old age pensioners, 6s 6d juvenile partnerships.

I am also ready to receive nominations for officers for 1971. If I do not hear anything to the contrary I will assume that current officials wish to stand for office again next year.

Please send your nominations in for all offices including president, chairman, executive committee and judges.

YEAR BOOK

Would anyone who wants an advert in the 1971 year book, forward it to me as soon as possible. The rates are £2 full page, £1 half-page, 10s quarter-page.

RULE AND STANDARD BOOK

The rule and standard book is now at the printers and should be ready for distribution towards the end of January.

VARIEGATEDS WERE SHOWN BEFORE 1933

J Wormald

IN THE December 3 issue of **FUR AND FEATHER** I was interested in the views of Mr Percy Swift, whom I remember as a fancier years ago. As he guessed, I do have Dr Kerr's book on colour inheritance in Fancy mice, and nowhere can I find a suggestion that Chinchillas be used in producing Variegateds. I cannot agree that a Variegated is a Chinchillated BE White apart from the genetical theory of such a mating being wrong, Chins were introduced by Dr J N Pickard around 1933, brought, I believe, from America.

Variegateds were being shown long before this, by myself, and Jim Busby of Sheffield, undoubtedly the 'Vari King' Jim's stock was never less than 100.

In Dr Kerr's book, Black, Cinn, and Agouti Variegated are mentioned, but in the genetical formula, in each case the Chin factor is notably absent.

Press on Percy, with your theory, you are just as entitled to it, as I am to mine.

The only breed, produced, established, and recognised by the NMC from the introduction of Chinchillas, is the Fox Group, many weird and wonderful mice have been produced but none established as a breed.

A broad theory, and unquestionably true, is that the Chin factor dilutes all 'yellow' pigment in the coat.

Black Fox can be produced from Black/Tans, similarly, Choc Fox, Dove Fox, Blue Fox, and even Cham Fox can be produced. My appeal for breeders for Silver Grey and Pearls met with no response, and it may be these breeds will vanish from the show bench in a year or two.

Two fanciers, Mr Bainton, and Mr Walsley have written to say they will try and produce Variegateds, I shall be pleased to have a chat with any fanciers interested, at Harrogate. You will find me under the 'Calder Valley' top hat.

Reading Tony Cooke's suggestion about club matches, I remember that this did once

get under way, and we had a Mouse Club league. This was in 1939, but the war brought it to a sudden end.

Each club nominated three Sells, Tans, Marked and AOV's at a show and points were awarded from 1st to res. It created quite a lot of interest at the time, but then we did not have as many shows, and a four cage box could travel to London and back for 6s I sent four mice to Hucknall Show, and the rail fare was 18s, add this to cost of entries, 12s, and I paid out as much as the mice were worth.

I find that good hay, sawdust and oats are difficult to get; and I cast my mind back a year or two on holiday in Scotland, I called on my old friend Jim Ferguson, he had a bale of hay in the mousery which gave off a lovely sweet smell, a bin full of big clean Scotch oats, all acquired by walking across a field to the nearby farm. Utopial!

The mousery was spotless, and I don't need to tell you what results Jim had with his Blacks, even if they were supplied by a 'Sassenach' in the first place. I am looking forward to Harrogate and meeting old friends, if this were the only show I visited each year, it would be a good reason for staying in the mouse Fancy.

THE FANCY MOUSE. By A C Jude. This book by a former president of the National Mouse Club is the standard work on mice. Every aspect of breeding, showing, management, colour inheritance and simple genetics is fully covered. Price 8s 4d post paid. (Full cloth.) From Book Dept, **FUR AND FEATHER**, Idle, Bradford, Yorks.

FOUR GENERATION PEDIGREE FORMS—Six forms 1s 3d, twelve forms 2s 6d, pad of twenty 3s 9d.—Available from Book Dept, **FUR AND FEATHER**, Idle, Bradford, Yorks.

METHODS FOR THE PRACTICAL BREEDER

Part 7 R G Silson

THE RULE OF TWO Genetics is a combination of strict rules and random choice. Chance decides where crossovers will occur. Chance decides which parts of a chromosome pair will go to a particular gamete.

Chance is unpredictable over small numbers but with large numbers of similar cases it is possible to predict precisely what is likely to happen. Each individual case is completely unpredictable in detail but it is possible to gamble on the average of hundreds of cases.

The same rules of chance apply to both living and inanimate things. The rules that enable a bookmaker to produce a profit permit the factory owner to run his machinery efficiently and also govern the results obtained by mating males and females to produce progeny.

Since sexual animals and plants normally have PAIRS of chromosomes and PAIRS of genes at each locus, the rules are those dealing with TWO choices. The simplest case of two choices is a penny. When spun or tossed a normal coin will have an equal chance of falling head uppermost or tail uppermost. It is however impossible to predict what the result of the next try will be. Even if one tosses tens, hundreds, thousands or even millions of pennies it is still not possible to predict the result of any one coin in the next toss. Despite this inability to predict any one toss the rule of equality of chance becomes ever more obvious as we go along.

If ten pennies are tossed there is approximately one chance in 1 000 tries that all coins will show heads. However if twenty pennies are tossed the chance reduces to less than one in one million that all twenty will be heads. Tossing 1 000 pennies at one time one would quickly make a fortune by betting that at least 450 would fall heads upward. The larger the number tossed the nearer the result becomes to half heads and half tails.

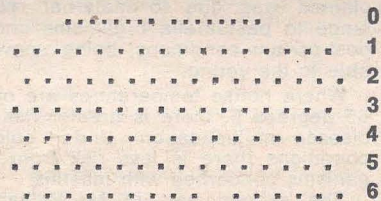
It is obvious that many breeders, with only small numbers of stock, fail to appreciate this rule as do the many punters who provide the bookmakers and pools promoters with a good living. The punter has a run of good (or bad) luck and believes that his system is the cause. The bookmaker knows that if he does his sums correctly he cannot lose whatever his customers may do.

Similarly the breeder must not be deceived by occasional extremely good, or extremely bad, progeny produced by his stock. In most cases they will be chance samples difficult to repeat. Unless the average quality of the breeding ing population can be changed the good ones are likely to remain rare.

More than 300 years ago a mathematician named Pascal was very interested in the laws of chance and worked out a few rules.

His most famous result is known as Pascal's triangle. Pascal's triangle shows simply and easily the rules governing a situation in which there are TWO alternate answers both determined by chance. The triangle can be quickly written on paper by anyone who can add two numbers, but it can be shown to work in practice by a simple model that anyone can make. All that is required is a stock of beads or ball bearings, say ½" to 1" in diameter, a board and a few nails, or dowels.

The nails are fixed in the board as shown in the sketch. The nails are spaced equally, just wide enough for the beads to pass freely. Each succeeding row is arranged so that the nails are exactly halfway between those in the row above. There is no limit to the number of rows but it may be instructive to add one row at a time and see that each one is equivalent to the same numbered row of Pascal's triangle.



The board should be fixed so that the rows are horizontal and the board near vertical. If beads are then dropped through the centre space of row '0', one by one, they will gradually fall towards the bottom. In each row each bead will balance on a nail and fall, left or right, into the next row, until the bottom is reached.

If the board is fixed level and accurately made there will be an equal chance of a fall in either direction. As with pennies we may have runs of falls to the left, or to the right, but over many tries the two directions will, on average, give near equal numbers.

Pascal's triangle shows the expected results when every ball (or every penny) has TWO equal chances left/right (heads/tails) each time it falls. Each row of the triangle is equivalent to one row of pegs and is numbered likewise. The first few rows of the triangle are shown below, with row numbers on the right, also totals.

	1	0	1	2 ⁰				
	1	1	1	2 ¹				
	1	2	1	2 ²				
	1	3	3	1	3	8	2 ³	
	1	4	6	4	1	4	16	2 ⁴

In row '0' a bead is placed in the centre space. It can fall two ways into row '1' giving one chance in each position. Beads in row '1' can each fall two ways into row '2'. Thus in the centre position of row '2' there are two chances, one from each position above.

If we study the triangle we see that, in each row, every number is the total of the two numbers above it, to its left and right. There is no limit to the number of rows possible by using this method, although after the first dozen rows or so the numbers begin to become very large. Pascal's triangle shows how each bead has two chances as it passes through each row. If we look at the row totals, on the right we see that each total is twice the previous one, since each new row gives two chances. We also see that the row number is the power of 2 equal to the row total.

Small numbers of tries may give odd results, exactly as with tossing pennies, but repeated tries give results closer and closer to those given in the triangle. With actual tries, as opposed to paper figures, the numbers represent proportions. Line '1' ½ left, ½ right. Line '2' ¼ left, ½ centre, ¼ right.

So far these numbers seem to bear no relation to practical breeding yet they are the basis of genetics and breeding results. The simplest use of Pascal's triangle is shown by considering the fact that many species of plants and animals have two sexes.

The progeny of a pair of animals may vary from few to many over a lifetime with one or more from each litter. The mixture of sexes from any one pair varies considerably but Pascal's triangle gives us an easy method of predicting sex ratios in litters of any size, or in several litters combined from the same or different parents.

Suppose that we take line '4' of Pascal's triangle and mark the order of the numbers, both right to left and left to right.

1	4	6	4	1	Line 4. Total 16
0	1	2	3	4	Order A Females
4	3	2	1	0	Order B Males

Since this is line '4' it can be used with a litter size of FOUR. What does the line tell us? Firstly line '4' totals 16. This figure shows us that there are sixteen different sex combinations possible with litters of four individuals. The first figure of the line is 1. Looking at order A we see that the figure below the 1 is 0. Looking at order B we see that the figure below the 1 is 4. These figures tell us that, on average, out of sixteen litters, of size four, one litter of four will have no females and four males. Repeating the process with the other numbers of line '4' we learn that four litters (out of each sixteen) will have one female and three males, six litters will have two females and two males, four litters will have three females and one male, and one litter will have four females and no males.

The same method can be used with any size of litter, always using

the line number that is the same as the litter size.

If we study the triangle over several lines we learn the perhaps surprising fact that although half the progeny are of each sex less than half the litters, of any size more than two, consist of equal numbers of each sex. With litters or samples of ten only one sample in four will have equal sexes. With samples of fifty only about one in nine will show equal sexes.

This result is quite important in practical breeding. Suppose that you wanted the simple requirement of a minimum of two daughters from each female used in each generation. Assuming, for simplicity, that all progeny families are of equal size, what size would be needed to ensure that this requirement was met. Pascal's triangle again gives the answer. With a family size of four only 11 out of 16 will have two or more daughters, roughly 70%. With five per family about 80% will meet the requirement, with six almost 90%. However to obtain 99% the family size needs to be TEN, and 100% is, for practical purposes, impossible. Even a target of 99% success is likely to be expensive.

The practical side of the problem can be better seen if the question is reversed. Suppose that we can afford space, time or money to rear about 100 progeny. The table below shows the results with different sizes of family but assumes that, in any one case, all families are of equal size. In the practical case of variable family size each size could be calculated separately. However the result is very similar if the average family size is used. A total of 100 progeny is assumed.

A	B	C	D
2	50	25	12
3	33	50	16
4	25	69	17
5	20	81	16
6	16	89	14
7	14	94	13
8	12	96	11
9	11	98	10
10	10	99	10

A= family size.
B= number of families.
C= % families with two or more daughters.
D= number of families with two or more daughters.

The table shows that with 100 total progeny the highest number of families with two or more daughters is with a family size of four and that about 30% of all females will leave less than two daughters. Similar results would be obtained with requirements for other numbers of daughters and for larger or smaller total numbers of progeny. It is obvious that for a breeder to aim to have at least two daughters from all his females will (Continued on page 1242)

and very good whip tail, coat a bit shaded today, congratulations on becoming a full champion 2 Nibblet's Reagan Camarilla, a very showy cat of good type and with a strong and attractive profile, good ear set and good eyes, close fairly light coat and excellent tail, a very close second indeed, this cat was not in the best possible trim today and will undoubtedly be a big winner 3 Wilson's Timberley Tessa, another fine cat having good general type but a slight pinch in muzzle, lovely ears, close coat and a good whip tail 4 Briscoe's Dunchattan Sarah Jane, good type and good eyes for shape and colour, even points but rather shaded and dark coat, tail could be longer r Graham's Edwardian Lorelei, well-shaped cat with good top of head and good eyes, pale and rather weak chin and pale muzzle, dense points, lovely coat and excellent tail. I RALEIGH

Mrs J Paddon

TORTOISESHELL 3: 1 ch Shepard's Willowglen Lotus Blossom, good type and nice eye colour, well patched including three paws, one paw dark, very attractive queen and well presented 2 Hill-Hartley's Brynbuboo Tortella, another nice Tortie with very good eyes and bright patching, good type but not so well coated as winner 3 Robinson's Lambeer Easter Bonnet, this queen and the 2nd winner were almost neck and neck and I took some time trying to decide, there was little to choose between them, she had better coat but slightly paler eyes. They were all three nice queens. My thanks to Mrs Absalom for stewarding this class for me. **AOC Ad 2:** 1 Skinner's Pathfinders Blue Shades, blue Tortie and White, beautifully patched, nice shape, good head and eyes, a pretty cat and well shown 2 Faris's Trymcote Andorra, a shaded silver with wonderful wide open eyes, type fair, well coated Kitten 3: 1 Skinner's Dorriwood Pansy, a very fascinating blue Tortie and White, nice head and eyes and well proportioned, good eye colour, very similar to my 1st in adult class and I see she is her daughter 2 Faris's Trymcote Dandy, a shaded silver, very attractive with a flowing coat, neither a Chinchilla nor a silver tabby, would like her eyes to have been green 3 Earle's Trymcote Earl, another shaded silver, rather poor type but with nice green eyes **AC Junior Cat (ex Blue) male 5:** 1 Bundy's Honey mist Snow Skier, a superb orange-eyed White, lovely snub nose, good eyes, short body and tail, groomed to the minute 2 Sykes's Starbourne Pioneer, a Smoke with good bone and lovely eyes, nice head but would like more contrast in colour and a deeper black mask, well groomed 3 Shepard's Gay Cavalier, a Black male with a really dense black coat, nice orange eyes and a short tail, could be a wee bit more typy r Hunt's Rozel Silver Moonbeam, a nice Chinchilla, good eyes and correct brick nose, very delicately ticked coat, but a bit short Female 15: 1 Tapp's Goravon Melanie, an almost perfect White queen, she has everything, type, pure colour, short tail, beautiful deep eyes, the lot 2 Absalom's Easter Girl, a very lovely Brown Tabby which I admire, a real gem and unfortunate to meet up with Melanie, she has lovely markings and her ground colour becoming richer as she matures, beautiful broad head and good orange eyes 3 Woodfield's Pathfinders Maytime, an extremely attractive Tortie and White, well regulated patching with requisite area of white, good eyes and wonderful type ex 3 Hunt's Rozel Petite Fleur, a very pretty Chinchilla, well ticked sparkling coat, with excellent eyes and nice head r Beck's Honey mist Tantara, a very typy Blue-Cream, excellent eyes and a delightful tipped nose, coat nicely blended blue and cream. This was a very difficult class to judge as it contained so many lovely exhibits, all of which were high winners in their respective open classes. All the rest of my classes were club ones so I am not reporting on these but the winners can have critiques on request. My grateful thanks to Mrs M Robinson for so kindly stewarding for me. J F PADDON

BLUE PERSIAN

(continued from December 3 issue)

Mrs J Thompson

Congratulations to the show manager, Mrs Crickmore, and the committee of the Blue Persian Cat Society for a successful Championship Show on November 7 at the Chenil Galleries in London, and appreciate thanks to my steward Miss Enid Marshall who is so efficient and attentive.

CHAMPION OF CHAMPIONS 3: 1 Knight's Ch Rojodanco June Rose, a lovely queen excelling in all round quality, broad head and muzzle, wide awake copper eyes, firm chin, neat little ears placed well apart on her broad skull, long fairly sound coat 2 Newsome's Ch Gaydene Robin, broad masculine head, short nose, lovely round copper eyes, coat good in texture, and length, but rather shady, excellent physical condition 3

Williams's Ch Peereth Eloise, an attractive queen with the palest soundest coat in the class, pleasing short face and short broad nose, firm chin, round orange eyes, in good condition and well presented Female 5-9 mth 10: 1 Percival's Susa Copella, well balanced head with neat well placed ears, firm chin, short nose, round eyes, good in colour, coat a lovely sound medium shade of blue 2 Page's Woburn Darleen, lovely kitten pressing winner closely, good skull with neat well placed ears, broad nose, good chin, short tail, lovely copper eyes, long flowing coat which was partly changing to adult coat so she was shady 3 Rawling's Ardwyn Shareena, good type, neat well set ears, short nose, firm chin, wide awake eyes, good in colour, coat long, but rather shady r Gibbs's Susa Capella, very similar to her litter sister but not quite so good or sound in colour vhc Thomas's Crowdecote Roxana Female 3-5 mth 13: 1 Brine's Avernoll Kimella, a lovely kitten, excelling in all round quality, sweet short face, broad short nose, firm chin, her neat little ears very well placed on her broad skull, lovely deep eye colour, coat sound and good in texture 2 Hall's Alcmund Josephine, good head and type, long flowing pale blue coat, fine in texture 3 Hall's Alcmund Justine, sweet snub face, neat ears, good tail, long pale coat, a replica of her litter sister Josephine r Dodd's Sunacres Lavinia vhc Cordell's Hannaford Breeders female 3-9 mth 13: 1 W Darleen 2 A Josephine 3 A Justine r Cordell's Chatbleu Fiesta, a big kitten with a lovely coat and in good condition but not so good in type as those above and her ears not so neat as they should be vhc Hannaford's Tortcloud Tamara Paris 9: 1 Brine's A Kimella and A Jolisee 2 Page's W Davy and W Darleen 3 Hall's A Justine and A Josephine r Exuma Maximilian and Exuma Adam Neuter Limit 4: 1 Claxton's Gentian Muffin, lovely broad head with neat little well placed ears on his broad skull, short nose, firm chin, good eye colour, long, sound medium blue coat, excellent condition and presentation 2 Shepard's Startops Rocky, another handsome neuter in lovely condition, pale coat good in texture, neat well placed ears, good eye colour 3 Thomas's Crowdecote Dougal, good head, wide awake eyes, good in colour, pleasing coat and condition. Some of the other lovely exhibits which I judged in other classes were: Newsome's, Gaydene Gloria, Judge's Shalfleet Darrit, Graham's Marmsbury Theseus, Tillotson's Brackenhill Corin, Marshall's Premier Marmaduke of Pensford. JOAN THOMPSON

Cat Club News

MIDLAND COUNTIES CAT CLUB SHOW

Mrs M J Groom, show manager of the Midland Counties Cat Club championship show held on October 24, writes that she regrets that the payment of prize money for the show will be delayed until early in the New Year. The many entry forms which the Governing Council of the Cat Fancy needed for checking have not yet been returned to her and she will be away on holiday for two weeks. She offers her apologies and regrets for the delay.

SOUTHERN COUNTIES CAT CLUB

Nominations for Southern Counties Cat Club delegates to the Governing Council should be sent, in writing, to the hon secretary, Mrs B Barron, 54 Sweetcroft Lane, Hillingdon, Middlesex, by January 31, 1971 (postmark). Such nominations must be proposed and seconded, and the nominees must express their willingness to stand. The two retiring delegates are Mrs Blanche Barron and Mrs Mildred Johnson, both of whom are eligible and willing to stand.

SUFFOLK AND NORFOLK CAT CLUB

Show managers for the Suffolk and Norfolk 1971 show will be Mrs H Philpot and Mrs J Dodd; cup secretary, Mrs Hardcastle.

ESSEX CAT CLUB

The third annual general meeting of the Essex Cat Club will be held on Saturday, March 13, 1971 in the Recreation Rooms, Billericay, at 3 pm. In accordance with the rules, all officers and three committee members—Mrs Brooks, Mr DeFerry and Mr Cordell (co-opted member) stand down, and all are eligible for re-election. Nominations for president, vice-president, chairman, vice-chairman, secretary, asst secretary, treasurer and asst treasurer and for three committee members, which must be seconded and signed by the nominee as willing to stand, to reach me by January 31 please. Items for the agenda, also by January 31 please. Members are reminded that subscriptions are due on January 1, 1971.

The officers and committee wish a happy and successful new year to all members, clubs and fanciers. F E MARSHALL, hon secretary, 35 Barrington Road, Loughton, Essex

SCOTTISH CAT CLUB

The following are amendments to the schedule of the Scottish Cat Club show to be held on February 6. Club classes 183, 184 and 185 will be judged by Mr Tomlinson.

A printer's error placed the title 'Edinburgh & East of Scotland Cat Club' at the top of page 7. This should have been printed at the top of page 10, above the E & ESCC Classes 201-209.

SIAMESE CAT ASSOCIATION

Will all members of the Siamese Cat Association please note that our next issue of the News Journal is now in preparation. All articles, advertisements and notices should be sent as quickly as possible to the Editor, Mrs Jess Wilson-Taylor, Breck House, Whittington, King's Lynn, Norfolk. The annual autumn party was held on November 21 at the Great Western Royal Hotel, London W2, when the committee were very pleased to welcome over sixty members.

A most enjoyable afternoon was spent in comfortable surroundings enjoying an excellent tea served by very efficient hotel staff. As in the past, advantage was taken to distribute the Association's cups and trophies, won during the year by members. Our president, Mrs Phillis Lauder, graciously presented the prizes, ably assisted by our cups secretary, Mrs Jean Burton, and other members of the committee. A raffle was held and a collection was made in aid of the distressed cats fund. Master Garrat Smyth very ably assisted in drawing the winning numbers, and a good time was had by all.—LEONARD CARTER (hon secretary), Newholme, Cedars Avenue, Mitcham, Surrey.

NEWS ADDRESS

Mrs Helen Every now resides at 17 Upper Phillimore Gardens, Kensington, W8.

Tributes

(Continued from page 1213)

P WILLIAMS and T MACEY

The Welsh Fancy was shocked to learn of the deaths of two of its oldest and highly respected fanciers. I refer to Mr P Williams and Mr T Macey, the father of the well known Cardiff secretary Mr E Macey.

This is the third loss to the Cardiff club this year of senior citizen members. The first of course was Mr W Murphy.

On behalf of the Welsh fancy I extend sincere sympathy to both families. Also to the Cardiff club in their loss of the fellowship and experience which was always readily available from these Welsh stalwarts. D CADDICK

HARRY BREWSTER

It was with great regret that I heard that Harry Brewster, president of the Luton and District FFC died on November 4. He was associated with the club for over forty years and was secretary/treasurer for twenty-five of those years. In his hey-day his Ermines were very prominent. Our condolences go to his widow, Lily, who pours our cuppas at the Luton shows. TREVOR RAWLINGS, General secretary/treasurer Luton and Dist F and F Club

WILLARD DUGDALE

It is with deepest regret that I record the death of Mr Willard Dugdale, a true fancier whose generosity and kindness was second to none. Willard suffered a tragic blow when his wife died only a fortnight ago. No words of mine can express how deep will be the loss, not only to Blackburn Rabbit Fanciers Society, but to the rabbit fancy as a whole by his passing. A McKIBBIN

I have just heard the tragic news of the death of my great friend and fancier Willard Dugdale, less than a month after the death of Mrs Dugdale. What a loss to all who knew him, as honest a man you could meet especially to the new and the young fanciers.

Stock and advice was received from Willard with the bonus of his lasting friendship. I can not put to paper the respect I had for Willard. My greatest regret is our friendship had to end too soon. Our sympathy goes to all who knew him. KEN HOLMES and family, Barnoldswick

G HALLER

It is with deep regret that I have to report the death on October 20 of Mr G Haller, president of Sheffield Original Fanciers Society.

He was always willing to help anyone who needed it, and was always available. Our sympathy goes out to his family. H ROGERSON Secretary

JIM WYATT

The death occurred recently of Jim Wyatt of Bristol at the age of 90.

He lost his wife a few years ago, then fell and broke a leg. This made it impossible for him to look after himself. His stock was sold and he went into a home, he was returned to Abbots Leigh for his burial.

He was a life member of the UKDC and SWADRC. He bred his Dutch small, on average 3 1/2lb. W R BURGE

BREEDING

(Continued from page 1217)

not be very economical. This type of problem may mean that a breeding system needs to be modified to give best results. Merely muddling through can be wasteful in terms of breeding progress. It is so easy for a breeder to be wise after the event and claim that his system brought success when, in fact, the above natural rules enforced his method. It is better to anticipate such problems and so use limited stock facilities to the best effect.

Pascal's triangle was here used in relation to sex ratios. It is equally useful in calculating the numbers to be bred to produce certain gene effects. It is useful both in minimising the cost of a breeding programme by breeding enough but not too many and, in the reverse case, by warning that success is unlikely with the facilities available. The breeder would be then best advised to save his money.

Pascal's triangle is useful only when handling small numbers of gene loci as the numbers soon become so immense that they are impractical to use. However other simple methods can be used in their place. These will be described later.

For fanciers who are busy developing new varieties involving the addition of only a few genes these rules can be very useful. For the fancier or commercial breeder wishing to improve more complex points, the other rules will be of value.

How to use these rules in both cases will be described later.

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NEWS OF THE WEEK

(Continued from page 1210)

HULL FA OFFICIALS

Hull FA officials are: President, treasurer and social secretary, Mrs K Elliott; chairman, A Rushforth; vice-presidents, K C Beercroft, S F Farmer; life vice-presidents (for past services to the society) Mr and Mrs W Hesselwood and Mr L O Dowson; hon secretary, D R Stephenson; show manager, S F Farmer; cup steward, C Lowthorpe. Juvenile representatives: Miss Sarah Farmer, Kevin and Mark Stephenson, Keith Watling. Committee: A Elliott, N Finch, M A Gardham, G W Gibson, K Thorley, F Waldron.

For 1971 the subscription is increased to 10s for adults, 3s for juveniles, pensioners free of charge.

THANKS

Mr W Sowerby and family thank all fanciers who sent letters of sympathy and condolence during their bereavement. Shildon, Co Durham.

HANDFORTH FFS

The annual general meeting of the Handforth Fur Fanciers Society will be held on January 10 1970 at 3 pm in the Scout Hall, Spath Lane. Nominations should be received by the secretary before January 9.

CHANGES OF ADDRESS

Mr Norman Stone now resides at 28 Third Avenue, Clipstone, Mansfield, Notts. John A Beck of Beckton Stud now resides at 7 Blenheim Drive, Filton, Bristol.

LUTON AGM

Luton annual general meeting January 10, 1971, at 3 pm, The Hut, Tomlinson Avenue, Lewsey Farm, Luton. All interested persons welcome. Maps on request. Items for annual general meeting agenda.

VENUES REQUIRED

Venues wanted for British Belgian Hare young stock shows, August 14 or 21; adult stock show December 11. Offers please to R Massey, Newton Lane, Bretby, Burton-on-Trent.

SCUNTHORPE SECRETARY

The new secretary of Scunthorpe and District Rabbit Club is R J Harris, 34 Marsden Drive, Scunthorpe. Chairman, H Hinch,