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Front Cover Picture

The CUSHMAN TURF CARE SYSTEM uses either a 3-wheel or a 4-wheel CUSHMAN TURF TRUCKSTER as the central carrier unit for an assortment of modular turf accessories. Shown on our picture are a transport and dumpbox, a Seeder-Fertilizer spreader, a 3-point mounted articulated Spiker and the Topdressing module. Other modules, as for example a very practical turf chemical sprayer are available as well.
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FERTILIZER treatment is an extremely important part of turf management. For best results it is necessary to use the right amount of the right kind of fertilizer and to apply it in the right manner at the right time of the year in the right weather conditions. The treatment must obviously be related to the condition of the turf and the demands made upon it.

Times have changed quite a lot and modern requirements are rather different to what they were in the old days. The modern golfer demands "better" playing conditions despite much increased wear and his wish for a good green colour and first class playing conditions in dry weather has caused many clubs to install up-to-date watering systems. This, in turn, is likely to increase the need for fertilizers. It will have to be faced that the beautiful fine turf, growing under extremely poor conditions of fertility, will just not stand up to these modern requirements and it seems that in very many cases changes in the composition of the sward resulting from feeding and watering are inevitable.

Grass, like other plants, needs a supply of many mineral elements from the soil but the three chief plant foods supplied in fertilizers are, of course, nitrogen, phosphate and potash. Of these three nitrogen is by far the most important for grass since it has such a high responsibility for the production of sufficient foliage. Phosphate has many important functions, not the least of which is healthy root development, but clearly without sufficient foliage there won’t be enough root. Potash is not really very important for grass but it affects both drought and disease resistance so that a deficiency of potash should be avoided. It is normal to apply all three plant foods to turf in the course of a year.

There are, of course, different fertilizers capable of supplying each of the plant foods. Some are quick acting and some are slow acting. A good greenkeeper tries to apply a good balance as between nitrogen, phosphate and potash and a good balance as between slow and quick acting fertilizers. He may do this by mixing (or having mixed for him) his own prescription of different fertilizers or he may count on the expertise of fertilizer manufacturers in their making up of proprietary fertilizers.

In the last year or two some of the ingredients that the greenkeeper would like to use have been in very short supply (e.g. dried blood, hoof and horn meal, etc.). New synthetic materials brought forward to fill the gap or improve on the old materials have so far not proved themselves entirely satisfactory. In the circumstances there has been a tendency for greenkeepers to turn more and more to proprietary materials if only to leave the head-ache of finding suitable ingredients to somebody else!

Interest in soluble fertilizers to be applied through a weed sprayer or a watering system sometimes arises, but there are drawbacks to both; e.g. the limited amounts that can be safely applied through a sprayer and the difficulty of getting uniform application through a sprinkler.

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As the moss goes the grass grows—and keeps on growing.

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from the rough needing little or no fertilizer, to the fairways requiring a little fertilizer occasionally, on to the tees, requiring rather more fertilizer and then to the greens, requiring intensive treatment.

**Greens**

The turf on golf greens has to stand a great deal of stress in the form of wear and of regular close cutting. To maintain a good sward, therefore, quite a lot of fertilizer is necessary. As soon as weather is suitable to allow good growth in the Spring it is necessary to encourage growth to bring the turf from the weary and worn condition resulting from winter play to the first class summer condition that is required for the main golf season. A complete fertilizer is usually given and those making up their own mixtures might use a mixture on the following lines:

3 lb. sulphate of ammonia
1 lb. dried blood
1 lb. fine hoof and horn meal
5 lb. powdered superphosphate
1 lb. fine bone meal
1½ lb. sulphate of potash
28 lb. sandy compost

The sandy compost is recommended to facilitate uniform spreading and minimise scorch risk. Calcined sulphate of iron, though not normally considered a fertilizer, may be included in the above mixture at the rate of 1 lb. per 100 sq. yds. It acts as a turf conditioner and helps to reduce risk of weed and disease invasion. Some proprietary fertilizers are made up to similar formulae but proprietary fertilizers may also contain other ingredients with a view to obtaining the same or better effects. It is sometimes possible for manufacturers to get hold of other waste organic materials and, of course, some products contain a proportion of the new "synthetic organics".

During the growing season further phosphate and potash may well be unnecessary if the amounts mentioned above have been given in the Spring but usually further dressings of nitrogenous fertilizers will be required, either as proprietary products or as homemade mixes such as:

1 lb. sulphate of ammonia
1 lb. dried blood per 100 sq. yds.
1 lb. fine hoof and horn meal
28 lb. sandy compost

The greenkeeper will use two, three or four dressings of this kind, timing the last dressing for about the end of August and quite often in this last dressing a little sulphate of iron will be included. It has been shown that Autumn dressings of nitrogen increase the risk of disease and so after the end of August very little (if any) nitrogen should be given.

The question of winter fertilizer treatment is one which is much discussed and there is evidence to suggest that winter fertilizers are being more used now than in the past, although it would seem that in most cases evidence of benefit from them is not very pronounced. On the other hand there are circumstances, particularly on greens built to modern standards of drainage (i.e. mainly of sand) where winter fertilization has proved necessary and beneficial. Very often winter fertilizers contain mostly phosphate and potash and some people compromise by including phosphate and potash in the end-of-August dressing.

**Tees**

Teeing grounds receive a lot of wear and so a fairly strong growth is required. In the past many clubs have neglected the tees to their own disadvantage.
Large teeing grounds in excellent condition are a great asset to any course. There has been a movement to bigger tees in recent years and, at the same time, appreciation of the need for fertilizing the turf. The kind of fertilizer to use on tees should be fairly similar to that used on the greens, although the frequency and amount can often be reduced. Further, economy can be obtained by using proprietary granular fertilizers containing balanced amounts of nitrogen, phosphate and potash such as might also be used on fairways. Whereas powdered fertilizers are preferred on fine turf areas such as greens (although some proprietary mini-granular preparations are also suitable) to ensure as efficient application as possible, the position is not so clear on tees. Powdered preparations are generally preferred but granulars are sometimes used for cheapness. On a close-knit fine turf the individual granules of an ordinary granular fertilizer are likely to leave little yellow scorch marks whereas on less fine turf the granules are less likely to have this effect, which may not be very important anyway.

**Fairways**

Fairways do not receive a great deal of concentrated wear and the chief requirement from them is a decent lie and recovery from divoting. Providing that these conditions are satisfied and that the appearance is pleasant, then less mowing there is to do the better! Obviously fairways do not need a great deal of fertilizer but, once again, the position has changed over the years. At one time fairways never received any fertilizer at all but nowadays occasional dressings of fertilizer are given, usually in the form of a proprietary granular fertilizer such as one...
containing:—
10% Nitrogen
15% Phosphate
10% Potash
applied at 2-3 cwt per acre.
This would normally be applied in the Spring and few fairways need more than one dressing a year, even if they need that. In practice, poor fairways are often short of lime as well as plant foods and appropriate treatment might include winter liming followed by Spring fertilizer.

The Rough
Nobody wants an excess of grass on the rough but it is desirable to keep some sort of a cover and there are now areas of rough on many golf courses where lime and/or fertilizer treatment is called for to maintain a cover.

Other Areas
There are areas on a golf course which sometimes seem to get forgotten. Surrounds to greens and tees, approaches to greens, and banks on various parts of the course tend to receive insufficient attention and will often improve a great deal if given a little suitable fertilizer.

Obtaining best results from Fertilizer
Getting the best results requires skill and knowledge. The most carefully chosen fertilizer will not achieve the desired end unless it is applied with a considerable measure of skill and judgement. Uniform application is essential and, on greens at any rate, watering in should be considered if rain does not fall fairly soon after application. Much of the value of a good greenkeeper lies in the skill and judgement he exercises in timing his fertilizer application in relation to the state of the turf, to the weather and to known requirements in the way of competitions and the like.

Diary Dates
Mar. 4 South Coast Section Lecture — Huxleys, New Alresford, 7 p.m.
5 Southern Section—Whitbreads, 6.30 p.m.

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N. Ireland - Richardson's (Ulster) Ltd., 1 Short Strand, Belfast BT5 4BS.
Tel: Belfast 57424/5/6

Eire - ICI (Ireland) Ltd., 5/9 South Frederick Street, Dublin 2.
Tel: Dublin 771831
BY PATRICK SMARTT

ONE OR two instances that came my way when secretary to a club in the south of England, have led me to wonder how many of us know what lies below the ground we play over, and ravaged with divots.

It is possible, I would not put it higher than that, the average member knows, or cares whether the sub-soil is clay, chalk, or sandy as on a links. It has to be granted that those who play on South Down courses would know they were on chalk. From the modern tendency for lush fairways, the links might cause doubt.

On park courses, what we amateurs deem ordinary soil differs, and requires different treatment at different clubs.

There are but two people in a club who know these things—all depending, to verge on the scientific, on the pH of ground. In lay terms, that is the acid or alkaline concentration in the soil. This can be measured by an indicator.

The couple are the Head Greenkeeper, and a secretary who (a) has a knowledge of the subject, (b) is permitted by the committee to run the course in conjunction with the Head man. The latter has generally graduated from the green staff. He has grown up in constant touch with the course; he can feel it in his bones. A good secretary can help.

The Green embraces the entire playing area, which is why the plural, Greens, is wrong. Club members are elected to the Green Committee. They come from all walks of life. Those who have well kept lawns, promptly assume they are experts. Never comparing the number of people who walk over their lawns, with those in spiked shoes who trample a golf putting green every day. The farmer and the agriculturist considers he understands earth and growing from it. He does. A golf course is a different problem. For that matter, would you expect a greenkeeper to prepare a Test cricket wicket and vice versa?

Perhaps the most frustrating is a clay base. Frustrating because clay has a habit of shifting its ground, and so altering the paths of underground streams. Here, I can claim experience. There was one hole, on a high course seldom affected by heavy rain, which ran downhill from the tee. It became, in racing terms, heavy to deep. A course born before the turn of the century, there were no drainage maps. Those splendid men on the green-staff set about it in the customary method. Lifting sections of the turf, and rodding the spaces in between. Time and again the rod came up against an immovable object. It was herring-bone pattern, leading into the main channels. All had been laid a few inches under the surface. We lifted over 3,000 pipes, mostly askew of the line. Two reasons are presented. A wartime bomb struck close to that fairway, the ground shock-waves sufficient to jerk the pipes out of position. There is today a memorial to the Canadians, camped there, who perished on that day.

The second reason is, that in those days of horse-drawn machinery, the depth at which the drains were set was insufficient to withstand the weight of the tractors of modern times. A quantity of those pipes had to be replaced. Although there were maps of the course from its early days, none showed the draining system. One of the older members of the De Le Warr Artisan club, came to our rescue by point out where the original 1st green had been. It was now overgrown, but we dug and unearthed sufficient pipes to fulfil our needs.

[Turn to Page 13]
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The British Golf Greenkeeper
We never did discover the source of a stream that ran diagonally across that fairway, but one of the staff found a golf ball some four inches below the surface. It had bramble markings—that is ‘pimples’, for the benefit of latter-day golfers. Obviously very old, and therefore interesting. What was left of the paint was grey, and the name, in a circular form, indecipherable. I have a smooth gutta, and a moulded one of that ilk. The ball is beside me, as I write, and reference to a book: “A HISTORY OF GOLF IN BRITAIN.” Plates that follow page 81, (for those interested) leave me in no doubt it is a Haskell. The first rubber-cored ball. It was imported from America in small numbers, and contributed largely to Sandy Herd’s winning of the Open in 1902.

A further example of our lack of knowledge of conditions underground, came to light when a green looked unhappy. In this, it will be observed only by those close to nature. Again we had to excavate, in the hope of finding the cause. Turf after turf was laid aside, until the surface was bare. This, in the early autumn because it was essential to replace the slices of turf, and let them knit before the frosts.

Finally, after going deeper we surprised a stream. The green was sloped downhill towards the player. There was no drainage, and the water ran too fast to favour the top-soil and the growth of fine grass to putt over. Some years before, when I first saw that green there was nothing wrong with it. Another instance of the clay changing a water course.

Further afield, there is a course on which a Roman road traverses one of the fairways. So far as I know, the club has been spared from archæologists, but one wonders what other historical gems may lie below.

The most unexpected of all, is that beneath the 18th hole of a famous Sussex links was stored the supply, and pipes leading from it, of the oil supplied to the invading armies when they crossed the channel on D. day. The name “Pluto.” will revive memories to many.

It can be argued that if a golfer plays a round, with his mind on such extraneous matters, his concentration will be poor. That may, however, ease matters for the Head Greenkeeper and the secretary. They will not be bombarded with complaints about a dandelion on the 11th, badly cut holes, and rough too long—all traceable as excuses for a poor round.

**Postscript**

Within two days of completing this piece I learned of one of the green staff, searching for drains under the fairway of one of two holes built about sixteen years ago, when the course was altered. This course of my home club is on clay. After a long search, and no drains, he struck rock, not clay! Which goes to show, one never knows.
Turfgrass research

by J. Escritt, Director, Sports Turf Research Institute

Research may be defined as "careful search or enquiry after or for something" or alternatively, "endeavour to discover facts by scientific study of a subject". The word is used rather carelessly by some people who say they have carried out research if they have merely looked something up in an obvious reference book such as a dictionary!

We at Bingley do carry out a certain amount of research related to the first definition, i.e., we study reports of other people's work. Obviously in the second meaning, i.e., the scientific study of our subject. Scientific research can be of more than one kind—so-called pure research is aimed at elucidating the facts of science and the reasons for them, whilst applied research is aimed at providing solutions to practical problems. As regards turf production and management, most of the research throughout the world (including our own) is obviously of the applied kind. Indeed for many years our emphasis (in keeping with the times) was on the maintenance of existing turf areas rather than on the construction of new ones.

The earliest known research on turfgrass was in the U.S.A., plot trials having commenced in Connecticut in [Continued facing page]
1885 and at Rhode Island in 1890. The Sports Turf Research Institute in Bingley was not set up until 1929!! In much more recent years important turfgrass research centres have been established in Western Germany and in Holland.

There is, of course, a New Zealand Institute for Turf Culture, an Australian Turfgrass Research Institute and a South African Turf Research Association.

A marked interest in turf research has now developed in Canada, Japan, Russia, Austria, France, Switzerland, Sweden and to some extent, in Denmark. By far the greatest amount of turfgrass research work has, however, been carried out in the U.S.A., where most of the research is now carried out at the Universities.

Several British Universities are now taking an active interest in some aspect or other of amenity turf, frequently related to the ecology of various situations other than sports turf. In the Botany Department of Liverpool University, Professor Bradshaw has several workers concerned with turf work, an outstanding interest being reclamation of derelict land including selection of grasses suitable for land with mining waste contaminated with lead for example. The soil department of Aberystwyth University is doing very useful work on soil, on sports turf drainage and, I believe, some work on sports turf grasses.

We must not forget, of course, the contribution made by commercial research. Much of this may be of more value to the firm concerned than to users in general but this is by no means always true.

The Sports Turf Research Institute at Bingley has, however, long been

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The Institute

The Sports Turf Research Institute was started up by golf (as the Board of Greenkeeping Research) in 1929 but since 1951 it has had its present title and has been managed by a Board representing all the major sports. By far the greatest part of the income of the Institute is derived from subscriptions and fees from individual clubs, local authorities and other organisations using our advisory services. The difference between what the various organisations pay and what it costs to provide the advisory service to them has had to provide the main financial support for the research work and this is supplemented to some degree by contributions from the research fund, by some support from the Trade in general and by contributions from various firms interested in any particular research we are doing. Lack of money for research is, and always has been, a limiting factor at Bingley—it has been difficult or impossible to get people to understand the scale of expenditure required. Of this, more later.

One trouble with research is, of course, that it is never finished. When one has investigated a subject fairly fully at any given time it is not long before changing circumstances make it necessary to look into the whole thing again. I have studied past Journals and Reports of the Institute and you may be interested in a catalogue (not complete) of work that has been done. You will see that much of it needs to be repeated from time to time, not necessarily because the work was inadequate but because circumstances have changed. In this connection, of course, it has to be appreciated that the general approach to production and maintenance of turf is much different from what it used to be. At one time people’s ideas of the cost of a new playing field, for example, were tuned to the idea of a few pounds to mow down a farmer’s field. Nowadays costs of up to £2,000 per acre for playing field construction are accepted as normal and an eighteen hole golf course may cost £50,000—£100,000. People are also prepared to face much higher costs on maintenance in order to achieve higher standards and make possible the increased use which extra leisure time brings about.

Most of our results have been obtained at Bingley but from time to time there have been trials at outside centres, i.e. on practical sites.

ONE of the largest educational conferences and shows in the golf profession will officially open its doors on February 16, 1975 at The Rivergate in New Orleans. The Golf Course Superintendents’ Association of America’s (GCSAA) 46th Annual International Turfgrass Conference and Show will offer superintendents, club officials, golf professionals and any one else interested in the profession an inside view of new developments through a combination of educational assemblies and an industrial exhibition.

Although the annual activities of this golf turf management profession will actually begin February 13 in Pensacola, Florida, with the GCSAA Championship Golf Tournament, followed by Pre-Conference seminars on pesticide usage and financial management in New Orleans, February 15 and 16, the conference will officially begin on Sunday, February 16 and run through Friday, February 21.
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However, the larger high work rate machine is more expensive and its initial cost may make it difficult to fit the new machine into the annual budget, especially when so many other items are inevitably needed at the same time. Ransomes have provided an answer to this problem by introducing a leasing plan.

Ransomes Leasing Company, a wholly owned subsidiary of Ransomes, was established in 1972 when the need for a scheme of this kind was foreseen. Since that time, demand for the service has mushroomed. Most of the "customers" are golf clubs leasing the Ransomes-Hahn Tournament Triplex green management system. Local authorities too find the scheme useful for the purchase of gang mowers, Hydraulic Power 5/7 Gangs, Motor Triple and Motor 5/3 machines.

The whole range of Ransomes professional grass machinery is available under this scheme, although there is a minimum limit of £500. Leasing offers certain financial advantages over buying outright. In the current circumstances of high inflation, leasing means that new machinery can be obtained before prices rise, and it means that equipment can be acquired without borrowing money at today's high interest rates.

Interest rates are fixed for the entire leasing period when the agreement is signed, so the lease itself will not be affected by inflation. Leasing allows more accurate budget planning, and frees capital for concentration in other areas. Leasing rentals are fully tax deductible and the tax relief gained on the lease payments can be claimed as a business charge against profits. This can lead to a smaller tax liability than the usual "capital allowance".

How does the plan work? Ransomes Leasing Company pays the capital sum to the dealer who supplies the machine. The lease is split into a primary period of three years, during which a fixed quarterly payment is made, and a secondary period of four years with a much reduced annual payment. If it is decided to dispose of the equipment after the initial three year period, this is just as easy as if the machinery had been purchased outright.

There is no problem in getting a lease. Any Ransomes distributor will help in filling in the application forms. The acceptance of this application by the Leasing Company serves as the basis for the leasing agreement, cutting paper-work to a minimum.

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SECTION NEWS

A nationwide round-up of news from the branches

Welcome to J. McMillan, his two sons and first assistant D. Lane of the Bush Hill Park Golf Club, who joined our ranks in December.

Welsh Section
President: J. BIRD
Treasurer: D. C. OLIVER
Lynwood, Lywnpia, Rhondda, Glam.

Amended Handicaps
M. Jones 7 to 8
D. Jones 8 to 9
M. Parry 9 to 11
J. Sarsby 10 to 12
C. Thompson 10 to 12
G. Cox 9 to 11
J. Borja 24 to 18

Congratulations
Congratulations to Mr. Henry Stead on his new appointment as Head Greenkeeper at Bargoed Golf Club. Well done Henry, may your reign be a long and prosperous one.

Sheffield Section
President: S. K. ARNOLD
Hon. Secretary: B. V. LAX
153 Kilton Road, Worksop, Notts.

OUR lecture on December 5th was very well attended, and I am sure that everyone found the talk by Dr. Clutterbuck of S.T.R.I. very interesting.

Dr. Clutterbuck’s subject was soils and sands for golf courses, and in his talk he raised some very interesting facts. He stressed that the basis of all turf culture must be a good soil, afterwards, in the question and answer spot, some very good points were discussed.
out of which most of those present must have gained helpful knowledge.

We thank Dr. Clutterbuck for a really enjoyable afternoon, and hope to be able to meet him again in the future.

Our lecture on the 6th of March is one to be given by Mr. C. J. Head (Chipmans Ltd.).

Northern Section

Chairman: J. SCOTT
Hon. Secretary: W. HEELES
Wetherby Golf Club
7 Tentergate Close,
Knaresborough, Yorks.
Tel: K'boro 3851

OUR thanks are due to the Committee and Members of Howley Hall Golf Club for granting us the courtesy of their Course and Clubhouse, to enable us to play a Turkey Trot Competition on the 5th December. 36 Members participated in the event, and the winners were as follows:—R. Gaunt, 31 points; W. Heeles, 30 points; A. C. Burge, 28 points; R. V. Lambert, 27 points.

The Annual Dinner was held at Oakdale Golf Club, Harrogate on Friday, 13th December 1974. Members and guests had a most enjoyable evening. Guests included Mr. J. R. Escritt, Director of the Sports Turf Research Institute, Mr. H. G. Sedcole, Captain Oakdale Golf Club, and retired greenkeepers. Following the dinner members of the Oakdale Golf Club put on entertainment in the form of a Cabaret—altogether a very good evening, it is a pity more greenkeeping members did not participate.

South Coast Section

Chairman: E. R. JAMES
Hon. Secretary: N. M. STIMSON
North Wilts. G.C.
Devizes.

MR. J. F. Franks of Twyford Seeds Limited gave us a most informative talk on Tuesday, 3rd December 1974 at Alresford Golf Club. He spoke of the many considerations which have to be taken into account when choosing a grass variety or mixture to suit special conditions.

Mr. Franks mentioned a new variety 'Pencross' which had been introduced on many of the new golf courses and he explained the complicated, lengthy procedure which had to be followed before a new variety could be introduced on to the market. Mr. Franks then showed us a splendid cine film illustrating the Barenbrug range of grasses. It was a very interesting and entertaining evening and we wish to thank Mr. Franks for fitting us into his already tight schedule. The Committee were disappointed that Mr. Rupert Furneaux was unable to accept their invitation to attend their lecture evening.

The Section held a Christmas Dinner/dance at the West Cliff Hall Hotel, Hythe, on Friday, 13th December 1974. Despite misgivings about the choice of date, the function proved to be a great success and it is hoped that it will be the first of many. Members were delighted when Eddie Fox won the Star Prize. He deserves a bonus for all the hard work he undertakes as Tournament Organiser etc.

We wish to thank Mr. Lennie Nott of Thoresen Car Ferries Ltd. for providing the two passenger return tickets. Our special thanks to Mr. Don Stewart and staff of West Cliff Hall Hotel for the delicious meal and for looking after us so well during the evening. Thanks too to the Trio who provided a marvellous selection of tunes to which we could step the light fantastic, and our congratulations to Jim Fry and John Payne for organising a splendid raffle.

It is hoped that the recent escalation in petrol prices will not prevent members from attending the last of our winter lectures which will be held on Tuesday, 4th March 1974 at 7 p.m. at the premises of Huxleys Garden Machinery, The Dean, New Alresford (please note the venue).
We are pleased to welcome the following members and we hope their association with us will be a long and happy one:—R. F. Plews, Vice President; T. Watt and D. Walker, Puttenham Golf Club; P. R. Sayer; Romsey Golf Club.

**North-West Section**

*Chairman:* E. WALSH  
*Hon. Secretary:* H. M. WALSH  
46 Peasley Close, Longbarn, Padgate, Warrington.  
34 Kingsfold Close, Breightmet, Bolton, Lancs.

The February talk will be given by Mr. A. Lees of S.A.I. Horticulture. Venue—Swinton Park Golf Club. Time, 7.30 p.m. Date, February 10th.

**Midlands Section**

*Chairman:* G. HART  
*Hon. Secretary:* A. KITE  
5 Lullington Close, Sutton Coldfield, West Midlands.

The Midland Section's Annual Dinner Dance is to be held at The Elms Hotel, Aldridge, Staffs on Friday 23rd May 1975. The reception will be at 7.00 p.m. in the ballroom and, there will be a four course meal followed by entertainment from a dance band. Tickets will be £3.00 inclusive and can be obtained from the Secretary, Treasurer and Committee members.

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