

September 1979

Number 81

The Mushroom Journal



THE OFFICIAL JOURNAL OF THE MUSHROOM GROWERS' ASSOCIATION
OF GREAT BRITAIN AND NORTHERN IRELAND

Confidential to Members

£2.00

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DIARY DATES

1979

September 19: Eastern Region meeting.
 Copdock, Ipswich, Suffolk.
 September 23-25: First North American
 Growers' Conference. Fairmont Hotel, San
 Francisco.
 October 11-13: MGA Annual Meeting and
 Conference. Carlton Hotel, Great Yarmouth.
 October 17-18: West Sussex Growers' Glass-
 house Conference. Main Subject: Fuel Saving.
 GCRI.
 November 5-10: Mushroom Week in UK.
 November 23-24: Annual Meeting and Con-
 ference in Krefeld, West Germany.

1980

February 26-28: BGLA Conference and
 Exhibition. Harrogate.
 June 9-11: 23rd Short Course. Pennsylvania
 State University.
 September-October?: MGA Annual Meeting
 and Conference. Bristol.

1981

August 14-19: Eleventh International Scientific
 Congress on the Cultivation of Edible Fungi.
 Sydney, Australia.

1984

Twelfth International Congress on the Culti-
 vation of Edible Fungi. Canada.

Editor: Fred. C. Atkins, O.B.E., 11 Apsley Way, Longthorpe, Peterborough PE3 6NE, England.

All advertising is handled by the MGA at headquarters in London.

Editorial . . .

Thoughts of Chairman John

When one decides to accept the position of Chairman of the MGA, the next Conference and the end of one's year of office seem a long way ahead. There are so many things to look forward to. Executive meetings to chair, sub-committee meetings to attend, presentations, dinners — to name but a few.

As the year progresses, certain things begin to create an impression in one's mind, things which a member who has not been Chairman will never fully appreciate.

One of these is the standing of the MGA. No, I am not just thinking about the standing of the Association in other countries throughout the world. This is quite clearly seen by the way some of them have modelled their associations on ours, and more recently the reception the 32 members received on the recent Canada/USA tour. No, I am looking more closely at home, things which the MGA has done in recent years, things which some sections of horticulture are very envious of.

Take publicity as one example. At the last BGLA dinner at Brighton, the NFU President, Richard Butler, quoted the Mushroom Growers as being one of the few sections of horticulture who had done anything to publicise their own produce. Whether or not we are using our publicity resources in the most advantageous way will always be open to debate. Nevertheless, we have a system devised over the years to collect this publicity income, a system which is simple but effective, a system which other sections of the Horticulture industry are now trying to emulate.

Secondly, we have the recent survey which was organised by the Manpower Committee. This survey was returned by 47% of the growers, and represents a UK production capacity of 75% of the industry. The MGA now has at its disposal a tremendous statistical knowledge, a knowledge which is not available to any other

sector of the agriculture/horticulture industry and will prove invaluable, enabling us to speak with authority on many important issues.

These are two examples of which the membership can be proud. They have been organised by the staff and the sub-committees in a very professional way. One might not agree with the way things are done and it is right that this should be so, but the MGA has developed these two systems which lead the Horticultural Industry.

C. John Bradfield



THE SINDEN AWARD 1980

The Sinden Award Committee invites members to submit to the MGA Director the names of anyone of their choice — preferably from among the younger generation, to stimulate them to continue their good work — who has made or is making an outstanding practical contribution to the Mushroom Industry.

Nominations must be received *not later than 1st December*, and be accompanied by not more than 200 words listing the grounds for the nomination.

The Award is a cheque for £100, a scroll, and an expenses-paid invitation to the Mushroom Industry's Annual Conference in Bristol in October 1980. It is open to British men and women engaged in research, development or advisory work or in industry.



Fisons Horticultural Division has bought the peat business of T. Howlett & Co. of Cleveleys, Lancashire. This gives them 1,400 acres of peat land to add to their 8,500 acres in Somerset and South Yorkshire.

Horticulture Industry, July 1979

FRED. THE ED. RETIRES

Fred. C. Atkins writes: 'Forty years of deep involvement in mushrooms have taken their toll. I am sorry I could not complete the last lap as Editor. Thank you, members everywhere; please give my successor the support you have extended to me'.



Letters to the Editor

THE LATE IVOR DUDLEY

You may have heard of our very sad loss of Ivor Dudley whom you and many others, especially overseas visitors, knew so well. He died very suddenly on the evening of 26th June of a coronary, at the early age of 54.

He had been my right-hand man for 29 years since he joined the Company. He became a very knowledgeable mushroom grower and Farm Manager and a most loyal friend. His loss is felt deeply by us all.

He leaves a widow and a married daughter.

John Stewart-Wood

MIXED NEWS FROM FRANK HARRAP

Dr. F. E. G. Harrap wrote to me the other day. 'Those who knew him when he managed the Mount Spawn plant will recall that in 1972 he was in a dreadful car accident; his wife Elizabeth had some ribs cracked and most of her limbs broken and was unconscious for close on two months. Last year she was 'managing very well and fairly active. In fact', Frank told me, 'the last two years have been good progress for both of us'. But since then she has spent ten weeks in hospital, firstly to have an operation to replace her right elbow and then, despite all precautions, she went down with malaria after a recuperative holiday in the Solomon Islands. What wretched luck...

Frank himself is now Acting Head of the Department of Applied Biology and Environmental Science, with teaching duties in Biochemistry and Plant Physiology, at the Ballarat College of Advanced Education, which has about 1,700 students. 'We have just received the All Clear to go ahead with a multi-discipline degree, with substantial chunks of Biology which will provide the Department with plenty of work', he said, adding: 'Best wishes to those friends who may remember me'. **Fred. Atkins**

INVITATION TO NEW ZEALAND

The members of the New Zealand MGA wish to extend a cordial invitation to anyone considering a visit to our country before or after the Eleventh International Scientific Congress on the Cultivation of Edible Fungi in Australia. We are very willing to assist in travel arrangements in New Zealand.

If anyone is interested, will he or she please contact Mr. Phil Hawley, Te Mata Growers Ltd., P.O. Box 137, Havelock North, New Zealand.

P. J. Hawley, President NZMGA

Canada Manpower and Employment has requested the mushroom industry's assistance in trying to place Vietnamese refugees on farms. They have both family and single persons who are readily available for work. Canadian employers who have employed these people report they are hard and willing workers.

Canadian MGA Newsletter, June 1979

Congratulations on their 75th Anniversary

Denis Locke reports: The first day of the MGA's North American Study Tour was spent as guests of Slack Brothers Ltd. **Irving Slack** himself, who had motored 70 miles or more to welcome our party as the plane touched down at Montreal, gave us a truly marvellous day. We saw his farm and spawn unit, and received also the most wonderful hospitality, Irving laying on lunch and an evening meal in conjunction with Canadian and American growers.

Irving's wife did a tremendous job in giving the ladies of our party a wonderful day's visit to places of interest in the locality and made the visit a memorable one.

During the course of the dinner, Chairman **John Bradfield** presented Irving with a silver 'Armada' dish, suitably inscribed, to mark our visit and the 75th Anniversary of his Company.

Irving, we all salute you and wish you continuing success — and hope we can all meet you again to celebrate your centenary!

Fred. Atkins writes: Irving and Meg have been special friends of mine for over a quarter of a century, and I had hoped to extract from them a story of their deep involvement in humanity as well as mushrooms; but they are reticent to talk about such matters. All I dare say is they are wonderful people.

For the bare facts of the Slack Story I am indebted to **Hank Taylor**, executive secretary of the Canadian MGA. He tells me that a number of growers from Canada and the USA joined in the Farm Walk and subsequent celebrations. The potted history reads:

Thomas Slack, father of **Charles** and **Fred**, purchased a farm in Waterloo in 1880 to which he moved his family from Arnprior, Ontario. This farm was to provide the base on which Charles and Fred formed a business partnership in 1904.

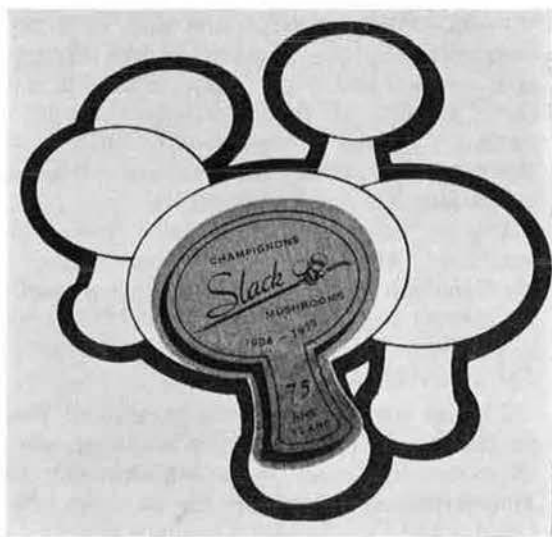
The following significant events took place over the next 75 years:

- 1913 Purchased land on Allen Street with established glasshouses for bedding plants and vegetables.
- 1915 Commenced the cultivation of forced rhubarb varieties.



Irving and Meg Slack

- 1917 *Started the cultivation of mushrooms on ground and later three-tiered beds in rhubarb-forcing space.*
- 1922 *Replaced old glass ridge-and-furrow houses with free standing glasshouses.*
- 1925 *Erected first American-type mushroom growing houses. Started first pre-packing of mushrooms in a package which has had only minor changes made to it over the years. Fred Slack was responsible for this momentous innovation.*
- 1929 *Commenced canning of mushrooms.*
- 1936 *Fred sold out his share of the business to Charles and moved to UK. Charles started to grow spawn under the patent originated by Dr. James Sinden.*
- 1938 *Dr. R. R. McKibben engaged during period. Robert Millinchamp also joined the firm. The last of the wooden structures built lead to a total mushroom cropping area of 325,000 sq. ft.*
- 1940-45 *Period during which Robert Flood joined firm to improve sales methods and Robert Millinchamp took over growing when notable improvements made with the help of Raymond Rettew. Discontinued growing spawn.*
- 1948-50 *Joe Hébert joined the growing team which helped to achieve a steady increase in mushroom yields. Started to construct cement block growing houses. Purchased overhead crane. Irving Slack joined firm.*
- 1951-55 *Old wooden structures replaced by new design. Formed limited company, shortly after firm was joined by Arthur Pinder. Continued to expand glasshouse area.*
- 1956-60 *Pieter and Jet Bels joined company to set up quality control and research facilities. Discontinued rhubarb operations. Harry Corthorn engaged as engineer succeeding Bob Millinchamp's retirement. Purchased first Linfield (Cuthbertson) turning machine.*
- 1961-65 *Conny Rasmussen started as consultant. Constructed office, fresh packaging and cannery facilities. Charles died after an active and interested retirement of 15 years. Cliff Worden joined firm to assist in engineering.*
- 1966-70 *Suffered through the ravages of virus and managed to survive. Started spawn-testing programme. Started installation of filtered-air system.*
- 1971-75 *Completed filter air-handling system. Developed two-zone growing systems. Firm joined by Dan Helynck, succeeding Harry Corthorn and Cliff Worden. Stuart McDonald joined company followed by Gordon Rowe, who were to succeed Robert Flood and Arthur Pinder due to retire in the next few years. Survived four months' strike, consequent poor crops and death of Conny Rasmussen.*
- 1976-79 *Further developed two-zone system on nets, casing machine and aerated-steam pasteurisation methods. Contract let to expand automotive and equipment maintenance facilities. Plans completed to call for tenders on 100,000 sq. ft. Phase II facility which will be automated for environmental controls and materials handling. Réal Milaenen joins staff.*



STATISTICS

Area: Land	750 acres
Phase II	90,000 sq. ft.
Growing and	
Cropping	610,000 sq. ft. = 700,000 sq. ft.
Staff: Executive, managerial, supervisory, technical and office	46
Technical and general labour contract workers	254
Total complement	300

Wages

Rates: Starting Employees \$6.05 (40 hr. work week)
After six months 6.50
Classified occupations 6.60 to 7.10
January 1980 increase 0.40/hr. and cost of living.

Fringe Benefits: Up to 5 weeks holiday, medical insurances, etc.

Operations: Compost mixture 15% synthetic
2.0-2.1 % Nitrogen
Filling rate 52,000 sq. ft./week
Spawning rate 1.8 oz./sq. ft.
Casing 30% soil, 70% peat
Fill Density 6.5 lb. DM/sq. ft.
Current Average Yields 3.2 lb./sq. ft.

Cannery Capacity: 10,000 lb./day.
2 solburn filters, basic product mix
4½ oz. and 10 oz. slice and Pieces-and-Stems.

Freeze-Dry: 7-day operation utilizing about 1,800 lb. fresh mushrooms per day, yielding 60 kg. of dried product.

Fresh Line: Retail packing line averaging 3,600 pint packages; 5 refrigerated trailers deliver daily.

THE NEED FOR MORE VIRUS INFORMATION

J. R. Tolhurst

Most growers at some time or another have had experience of having a virus infection on their farm. Some know how much this virus infection has cost them. In some cases the grower never knows that he has had a virus infection and in many cases those that do know never work out the overall expense of the outbreak.

However, there is little information available to a grower on the incidence and source of virus throughout the industry as a whole. As there appears to be an element of 'cross infection' between farms as one of the sources of an outbreak of virus on a farm, this information should be of great interest to all growers, and all growers should be prepared to assist in any way to enable such information to be collected and published.

A survey in October 1976 of 52 farms randomly selected was made by ADAS and the report in the November 1977 *Mushroom Journal* showed that 14 farms (27%) provided samples in which virus was found. This high percentage emphasises the seriousness of the virus problem and the need for an ongoing compilation of such data.

In discussion with others I formulated some suggestions how such records could be obtained, and arrangements were made for the suggestions

to be discussed at one of the periodic Discussion Dinners held by the MGA Research Committee at Worthing in February 1978. The following paragraphs record an 'aide memoire' circulated to the guests before the meeting.

During 1976 and 1977 my son David and I encountered two outbreaks of virus on our farm which we feel illustrate the need for greater action by growers and researchers to help reduce the incidence of this disease.

At the beginning of 1976 we were worried by variations in cropping and quality of our mushrooms. Visitors assured us this was nothing to do with the mycelium but was probably due to cultural abnormalities such as boiler trouble, low air temperatures, etc. As if to support this theory we had record yields in May, June, and July, when other growers' production was reduced by up to 75% due to the exceptionally hot weather. However, August figures were down when other growers were recovering and several members of a visiting team recognised symptoms of virus. Thus, by the time Mrs. Sharp at Harpenden had confirmed a virus infection in September 1976 we had probably had virus on the farm for over nine months. This precluded any hope of establishing the source of the virus. At the same time we had been unwittingly a continuing source of danger not only to ourselves but to our neighbours nearby and further away.

About this time, October 1976, ADAS conducted a survey of 52 farms chosen at random and 14 farms, i.e. 27%, produced samples which contained virus. Only two of these 14 farms were having mushrooms tested for virus on their own account, so we can assume that 12 farms were unaware that they had virus and were dangerous to themselves and their neighbours. Equally none of the farms could have any hope of establishing the source of the virus.

From September 1976 onwards we continued to have weekly virus tests, undertaken first at Harpenden, and more recently at Cambridge. At first we had 'feed-back' infection. Even a 'so-called' Virus Breaker Strain had some virus recorded on the 1st and 4th crops.

Eventually the problem was solved by cooking-out the growing boxes during the night previous to spawning. After this for nearly twelve months all samples were recorded as free of virus (except for anomalies which were subsequently proved incorrect). However, the samples from Shed No. 2 spawned on 11th October 1977 recorded two samples free of virus and two samples infected with virus. Further check on samples taken specially from five boxes almost bare of mushrooms confirmed all five boxes had virus. Further checks by ADAS confirmed that only these five boxes out of a total of 72 boxes had virus. It was established that these five boxes went through the filling line one after the other consecutively.

The incidence of virus is usually a slow and insidious process; as a result it is difficult to pin-point either the time and/or the source of infection. Once virus is established its progress is maintained by feed-back from the old crops to the new crops usually either (a) airborne from open mushrooms, or (b) fed back by live infected mycelium from old crops to new crops. In this case the time and incidence of infection is established due to regular quick testing. We know it to be within a narrow margin of five boxes on the spawning line. It is statistically unlikely that random fall-out of spores not present on the farm for twelve months could have picked on five consecutive boxes nor could spores have given such heavy and early infection. If the filling line had been infected before spawning it would have infected the

first and all other boxes — which did not happen. It is also unlikely that infected mycelium (from a shed which itself did not have infected mycelium on the previous crop) could have caused virus in five consecutive boxes and no others. Having eliminated the above possible more obvious sources we would be glad to have proof from anyone that a bag of infected spawn is not responsible or that there could be some other source of infection.

This experience has awakened us to the possibility of identifying sources of virus, provided farms have regular virus tests and investigate new outbreaks quickly.

For a long time we have been surprised by the unwillingness of people to have outbreaks of virus recorded and discussed frankly and openly. We have gained the impression that virus is a dirty word and the possibility of virus infection from spawn is 'dangerous talk'. Dr. Annemarie van Zaayen does not even list it as a possible source in her paper in *In Touch*. At Bournemouth a speaker mentioned a survey of twelve samples of spawn of which four had virus particles, without a question being asked! P. T. Atkey in his talk on Virus to a Study Group on 7th February did not at first include spawn as a possible source of infection but later described his tests on spawns during which he found two spawns out of 29 tested had produced sporophores infected with virus. ADAS publication *Mushrooms 1977*, page 13, says 'Recent research work has indicated that some strains of mushroom spawn contain virus particles. These spawns have not always given low yields. The significance of low concentrations of virus in spawn is not yet understood'. ADAS Survey in October 1976 (not reported until November 1977) plays down the seriousness of 27% of farms found with virus by saying 'only three farms or 6% had virus problems which could cause yield loss'.

It would appear that few people face up to the incidence of virus or take steps to establish the source of virus. Growers do not want to know in case it is their own fault, and fear libel or slander action if they prove it to be a spawnmaker's fault. Spawnmakers fear claims for consequential damage and/or bad publicity if it was the fault of their spawn. However, if no action is taken to establish the frequency of virus attack and the sources from which they come, growers will continue to experience serious losses, sometimes crippling losses, from this disease.

To improve the position we put forward the following suggestions:

- (a) Growers should indemnify spawnmakers against claims for consequential damage.
- (b) Spawnmakers should indemnify growers and members of the MGA, GCRI and ADAS against actions for libel or slander.
- (c) Growers should join a group under ADAS Record Keeping to have regular weekly samples tested at Cambridge for virus.
- (d) ADAS should monitor these tests, try to investigate and establish the source of infection, prepare simple statistics and publish each month's results monthly in the *Mushroom Journal*.
- (e) Research should try to find a way to test Mycelium Tissue rather than Sporophore Tissue so that tests can be made even earlier.

As growers' experiences duplicate our own experience and are publicised in the *Journal* more growers will be encouraged to join the group and realise the value of £3.00* a sample charge for Virus Testing.

In our second attack of virus we were able to limit the incidence of virus to five boxes out of 72 which we estimate to cost £300 instead of losses on the first attack amounting to thousands. We feel that other growers can do the same, thus reducing their losses and curtailing

the time span over which both they and other growers are at danger from airborne-infected spores.

These proposals received a mixed reception from the representatives at the Dinner and it appeared unlikely that the proposals would get official support.

Several growers are now (March/78) willing to have their tests collated and investigated and, in order to get some action started pending possible official action by the MGA, I am prepared to undertake the collation.

I have written this article to bring this service to the notice of as many growers as possible so that they will join. I would consider it a success if there were a group of 20 growers partaking in regular weekly testing for virus. Anyone interested should write to me c/o Clockhouse Mushrooms, Clockhouse Lane, Egham, Surrey.

* The sample charge for Virus Testing has since been increased to £5.34.

SAFETY ON MUSHROOM FARMS

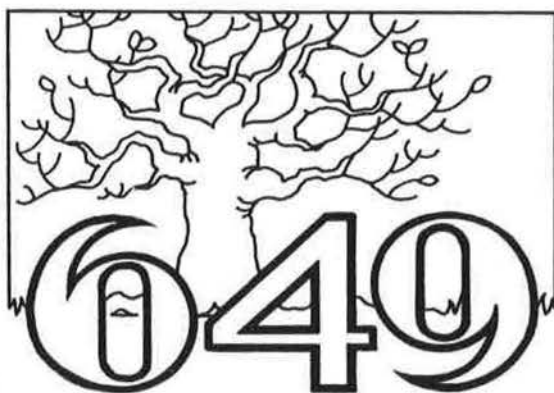
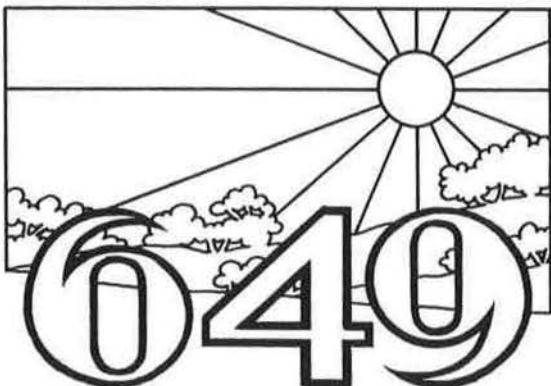
A British Safety Council Award for 1978 has gone to **W. Darlington & Sons Ltd.**, of Rustington, Sussex, 'for having achieved a lower accident rate than the national average for their industry'.

Congratulations to Darlington, who employ around 1,000 people at seven locations in the South of England.

James Tye, director general of the British Safety Council, said: 'If industry in general could achieve the same standards we would see a vast reduction in the current losses of over £1,000 million and in the inestimable suffering caused annually through industrial accidents'.

Dennis Cox, Darlington Group Safety Officer, tells us: 'We have put a great deal of work into implementing safety measures within our farms, production plants and workshops. The Group will continue to run training programmes to maintain a high level of vigilance, and as they incorporate a safety committee to draw attention to possible hazards it is intended to aim at making this award an annual event'.

(The *Journal* failed to discover what in 1978 was the accident incidence in 'the applicable industry'; but the national average was given as 38.2 accidents per 1,000 workpeople per annum. *What was yours?*)



'a strain for all seasons'

Spring, summer, autumn, winter — it's all the same to Darlington strain 649. Since it was introduced in 1966 many growers have found that 649 gives consistent output and quality throughout the year.

Recent side-by-side tests from our R & D department comparing the original 649 strain with present supplies show an increase from 5.04 to 5.45 lbs per square foot. For consistent quality control and increased yields choose 649 — the strain for all seasons.



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Winston Alderton *tells the story of*

Donald and John Bradfield and Catfield Mushrooms Ltd

A project which had its beginning with a £50 demob gratuity to one of two Norfolk brothers in the mid-1940's, soon after the Second World War, has so far developed that the concern now has two large mushroom farms, one of which, **Catfield Mushrooms** near Stalham, itself produces nearly two million lb. of mushrooms annually.

John Bradfield is the present MGA Chairman and has served on the MGA Executive Committee for eleven years. For the last ten years he has been mainly responsible for the organisation of the MGA's annual conference but plans to relinquish this task. Barry Howes is taking over.

Bringing the 1979 Conference to his home ground at Yarmouth has given John particular pleasure.

The brothers, Donald Bradfield and, junior by nine years, John Bradfield, started mushroom growing in a small paddock behind their parents' village store at Martham, near Yarmouth, at which time John was still at school.

Although this story is mainly concerned with Catfield Mushrooms, now run independently by John, with Donald equally running Broadlands Mushrooms at Martham, a few miles away, the two farms are still bound by a holding company and with consolidated accounts.

John Bradfield was still at school when the horticultural project as it was in the beginning, got under way, with success coming quite early with their first crop of mushrooms put down in the cellar of the village store. It was a matter of getting manure, putting down beds on the floor in the autumn, covering them with wet sacks and getting mushrooms the following spring.

The Fryers, then running Nashleigh Mushrooms at Chesham in Buckinghamshire, were the Bradfields' cousins so a visit to that farm did nothing but help.

Ridge beds were the order of the day but by obtaining old timber from bombed-out buildings at Yarmouth — new timber was then on permit

only — the Bradfields really began to get under way. Shelves were put up in old outbuildings and an old boiler purchased. Production of lettuce, runner beans and other outdoor crops was still going on.

So the brothers took a big decision, obtained a £2,000 loan from Lloyds Bank — Barclays had declined — and put up a Nissen hut followed by a Handcraft production house. The tax collector became interested; accounts showed that the brothers were making £1,000 a year but were being kept by their parents, but the need for accounting and for expansion became apparent. Soon mushrooms became the one and only crop.

Back it was to Lloyds Bank, a £20,000 loan this time and again without trouble, and Broadlands Mushrooms was well and truly away. A whole range of buildings was put up, so, by the time of the Yarmouth 1961 MGA Conference at which the Bradfields made their first appearance, a then modern mushroom farm was able to be visited by the delegates.



John and Freda Bradfield — pictured outside their home, Bleak House. On the right can be seen the gable end of one of their cropping houses

By then the shelf beds had given way to the tray system, with 4 ft. × 3 ft. 'legs down' trays. Production rose to 66,000 lb. a year. There was little or no mechanisation, other than a small Rotovator to assist with the spawning.

Like so many other farms, Broadlands went in for considerable expansion between 1960-65. Management was tightened and the 4 ft. × 3 ft. trays were replaced by larger ones.

Then came the momentous decision to purchase, at Catfield, a derelict old factory site which had finally been used as a transport depot before many of the buildings were partially destroyed by fire. Says John: 'People, including the planners, thought we were quite mad but we went ahead and got it. That was in February 1969 and, a few months later, one of the large buildings housed the MGA's machinery exhibition so many members will recall just what the site was like.' It had taken three months just to clean up the site.

So began Catfield Mushrooms, with the broad plan of getting into production as quickly as possible in order to use the profits to modernise the Broadlands farm. Compost was supplied from Broadlands, filled with a fore-loader into 40 sq. ft. trays, a loose fill about 16 inches deep, a double-tined loader to pick up two trays side by side, a peak-heat, spawning by hand and a final treading down by feet to a depth of nine inches.

Cropping sheds, 150 ft. × 25 ft., divided under the main factory roof by breeze blocks with Purlboard attached to the purlins to give ceiling insulation, each house holding 6,700 sq. ft. of beds, had been established, and with the cost of labour no real problem at that time, the system was maintained at the simplest possible level.

Sure enough in the first full year of operation, a satisfactory profit was made and so it has continued, with first the Broadlands Farm being completely modernised followed by Catfield. Visitors to the two farms, from the forthcoming Yarmouth Conference, will be able to see for themselves just what has been achieved.

By 1971 production on the joint farms had built up to 2½ million lb., roughly 1½ from each farm and a giant step from the 66,000 lb. production of ten years before. It was in 1972 that the brothers decided, quite amicably, to split up with Donald running Broadlands and

John, Catfield, and so it has continued ever since. To this day Catfield is supplied with 75 tons of compost by Broadlands although, to meet Catfield's full need, Hensby's also deliver 80 tons of compost every week. Production of the joint farms has now reached 3½ m. lb./p.a.

The system at Catfield. On receipt the compost is mechanically filled, a loose fill. Peak-heat takes five days and with the subsequent fill and consolidation, 1½ trays go into one tray, with a nine inch depth of compost at a density of 24 lb. per sq. ft. The trays are in the spawn-running rooms for 13 days, cased with an equal volume mix of peat and ¾ inch-to-dust chalk, and then on to the growing-on rooms, followed by transference to the production rooms where the picking period is 38 days. Trays have previously been in the holding rooms for ten days. Thus production houses are only in use for actual production and this enables 7.7 crops per year to be taken. In addition to the ten cropping houses there are two peak-heat, two spawn-running and four holding rooms.

Picking. For the most part picking takes place *in situ* except on occasions when heavy flushes call for the use of the U-shaped picking line. With the trays in the growing houses set in two lines, and with the tray placement positions permanently marked on the floor, picking *in situ* presents no problems at all but, says John: 'The use of the picking line is tremendously important on this farm. In use during heavy flushes it enables the picking rate to go up quite dramatically and we on this farm certainly would not like to be without the line. To make full use of such a line you must have boxes of adequate size, adequate depth and adequate strength.'

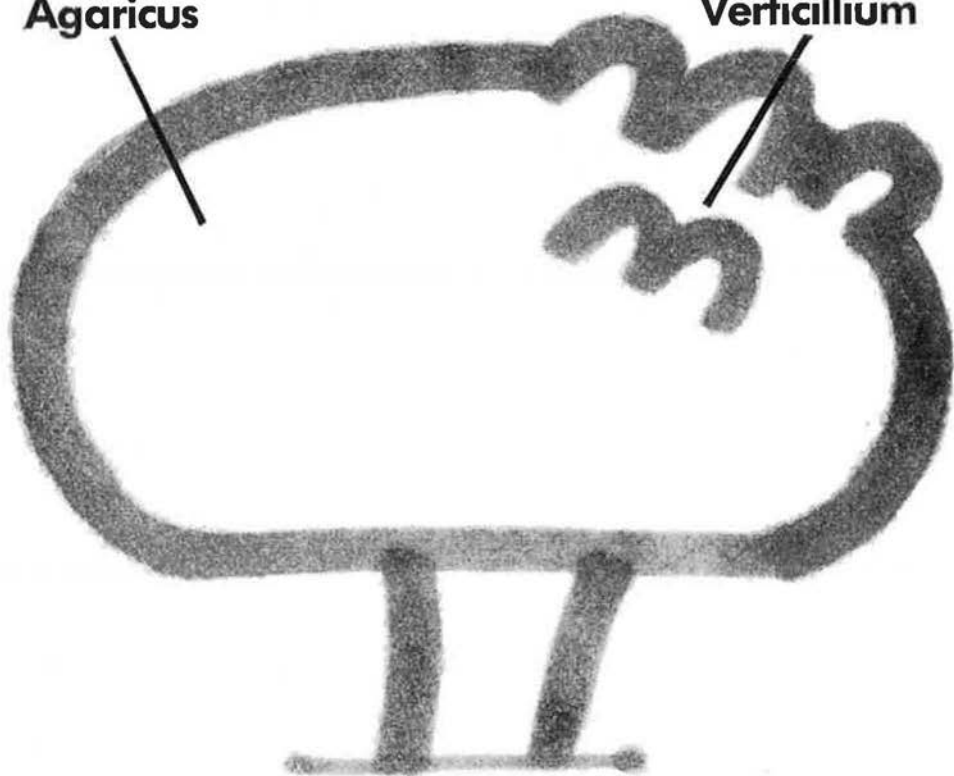
Flexibility. The Catfield approach to mushroom production is extremely flexible. The use of the picking line is but one example. So too is the fact that the weekly fill works out at exactly one-and-a-half production houses, and not only are there times when, in one house, first and second flushes are on the way but on occasions a half-crop can be somewhat older.

Events at Catfield are so ordered that those houses due for first and second flushes are always nearest to the picking line. The older the crop with the *in situ* picking the further away from the line it is.

DACONIL 2787 W.75 from Midox can tell the difference between fungus and fungus

Agaricus

Verticillium



Verticillium (dry bubble) feels very much at home on a mushroom.

After all, they're both fungi together.

One you want. One you don't. But there are few efficient fungicides selective enough to discriminate between them.

So to keep your mushroom crop bubble free, you need

something more effective. Daconil 2787 W-75, from Midox.

In packs of either 2½kg. or 25kg., Daconil is of wettable powder formulation and a broad spectrum, non-systemic fungicide. It combines a wide spectrum of crop safety when used as recommended. So harvesting could take place 24 hours after spraying.

Best of all it gives you highly effective control of verticillium and all its works.

So your mushrooms will never be seen in bad company.



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Daconil 2787 W-75 is a registered trade mark of Diamond Shamrock.

Production. Production works out at between 37–38,000 lb. per week averaging 3.8 lb. per sq. ft. per crop. Related to pounds of mushrooms per ton of delivered compost John accepts that production is not as high as it is on some farms and believes this is in part due to peak-heating problems stemming from the use of large and deep trays.

No Cook-out. After each crop is complete the production buildings are not cooked-out and never have been since the farm started.

The trays are emptied, then cooked-out to a top temperature of 170°F, and dipped into Santobrite.

Pests and diseases. Since the Catfield farm was started there has been no virus problem whatsoever. Attacks of *Verticillium* and *Mycogone* were dealt with adequately by benlate over six years.

Verticillium has been a particular and puzzling problem. Each year in early autumn the farm has been riddled with it and equally puzzling, it just disappears in December. The likely cause has at last been identified, everyone hopes. It is in this autumn period that a corn mill next door is working full out, dressing and cleaning corn from the current harvest. The dust etc. is discharged direct into the air and, it is now felt, penetrates the entire Catfield farm, with *Verticillium* virtually disappearing as corn dressing ceased. 'We were always told that *Verticillium* could be carried round a mushroom farm by workers but this does not seem to be so at Catfield. Our workers carry on just the same throughout yet the trouble goes with the end of corn cleaning' said John. Needless to say air filtration on a sophisticated scale is now being planned whilst the onset of the autumn period is awaited with more than usual interest.

Cecids have always been a source of trouble, due it is felt, to a slightly suspect peak-heat where, with large and deep trays, some small sections of compost escape the full treatment.

Blotch was a particular problem but once water treatment was switched from the mains to the farm reservoir and that reservoir treated up to five times a week with regular small doses of hypochlorite, Blotch was cleared up. Previously treating beds in individual houses with

chlorine added to water just had no effect at all. Others farms, it seems, are finding this out.

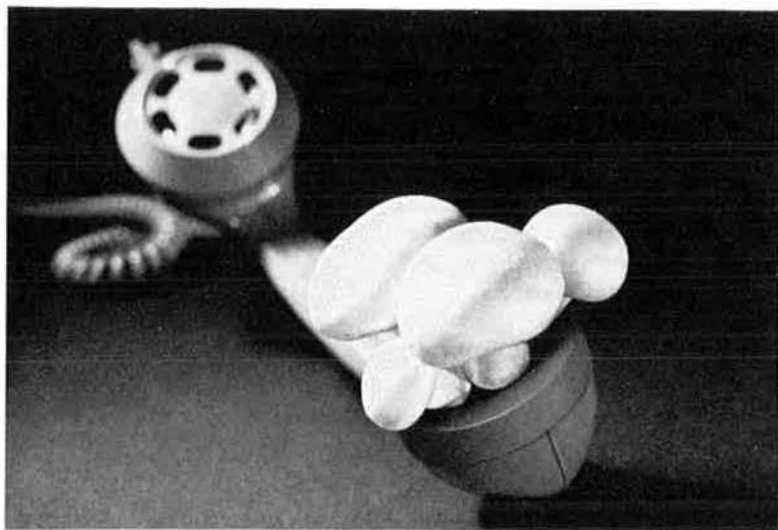
Suspect peak-heat. Peak-heating is automatically controlled for heat and ventilation through ten probes in different trays taking an average reading and transmitting this through two motorised valves which give the heat and fresh-air readings. An absolutely critical factor is that the equipment itself cannot think. 'For instance' says John, 'if in winter a load of compost comes in both wet and cold the reaction of the equipment is to work out that heating up to a certain temperature must be achieved within four to five hours. To achieve this the equipment pours in masses and masses of wet live steam, wet heat which would only aggravate the situation. What growers have to be able to do when using such equipment is to over-ride what the equipment says and, for example, put in dry heat only when that is required. The grower himself must examine and decide — the equipment is an aid and that's all it is.'

Marketing. One of the things that puzzled John Bradfield was the fact that, at MGA Executive Committee meetings, when growers there were asked to give their average price returns it always seemed that his prices and those at the Broadlands farm were always somewhat lower.

Enquiries then showed that, marketing through an organisation, as the two farms then were, resulted in the cream of the mushrooms being retained for special use and the remainder of lower quality were going to market. Now, apart from about 3,000 chips a week going in direct sales, everything else goes to market, mainly to Birmingham through six salesmen. The mushrooms are transported by the farm's own vehicles with the exception that a small proportion goes to Sheffield market, being picked up at the farm by the salesman's own lorry which has a daily load of other goods to deliver from the market to Norfolk. Spitalfields in London is used on occasions but deals with less than one per cent of the Catfield production. 'We get prices as good as anyone else now. We believe in market loyalty. If there are mushrooms about our salesmen know that they will get some from us' says John.

Staff. Staffing the farm has posed no problems and here again simplicity is the keyword. The

Hauser Information



THE STRAIN FOR YOUR NEEDS

Whilst the summer has not been overwhelmingly warm it has not passed by without problems. The production of consistently good yields is always difficult during the summer months and this year has proved to be no exception.

Cropping became erratic and the salesmen had to overcome wildly changing limits of supply and demand. However, it is within the cropping houses that the long-term problems may have been perpetuated. The summer brought forth numerous outbreaks of *Verticillium* and of course, flies.

Strain selection as always is of paramount importance, *bitorquis* strains have not always solved the summer problems and growers using the somewhat heat-tolerant white

strains have seemingly produced more consistently.

However, as the Autumn approaches a change of strain can often be most profitable. A6 has, without doubt, proved itself over the years as a quality strain, and following its success a new selection of A6 is now available. A6.2 offers the high quality expected from A6 and seems to show improved pinning behaviour.

Whatever your market, quality mushrooms pay dividends, so why not allow the Hauser Organisation assist you in meeting your demands.

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View of the ten production houses

general management is carried out by John himself whilst his wife Freda plays a big part in the administration work. Fifteen men are employed full time and there are 35 women pickers, some working full time and some a 30-hour week. The fifteen-strong office and ancillary staff make a total of around 65. Some part-time pickers are always available — they ring up the farm each day and come in if required.

'Freda and I and two foremen have been running this farm from the beginning' said John, adding: 'The time has come for a change so we are now going to have three additional people, one in charge of growing, one on quality control and one on maintenance. It is high time that one or two of us had a bit of a rest'. Employer-worker relationship plays a big part in Catfield farm where 20% of the staff have been at the farm since it first opened. This was marked by commemorative watches, presented at a special party in July.

Engineering Design & Production Ltd. This was purchased by the Bradfields in the early seventies and was moved to its present premises at Catfield. This came about because the original firm was asked to design a sophisticated process line for use at Catfield but to be made up in the mushroom farm's own workshop.

Its 'Traymaster' machinery has since become known throughout the mushroom world and Barry Woodcock and Tony Russell of the 'Traymaster' concern are now familiar figures in the industry.

Whilst its main occupation is directed at the mushroom industry, turning out filling, spawning and casing lines, conveyors, composters, up-and-over doors for peak-heat rooms, ventila-



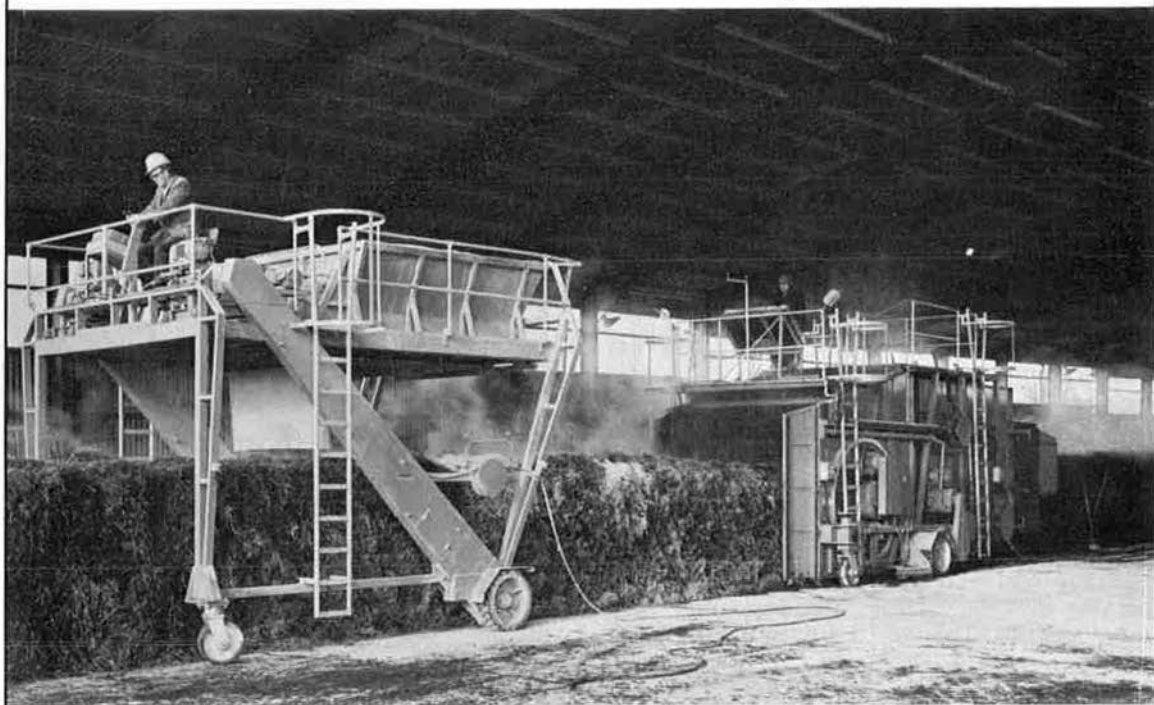
Inside a cropping house; note the sturdiness of the trays



The filling, spawning and casing line

tion equipment and so on — and it is now completing some special weighing equipment for use at Catfield — it has also turned out straw balers for farms and done work for an oil concern, for May and Baker, and for the Coal Board. Much of its highly sophisticated mushroom

... it's being filled !



Burcros have installed two new machines in their yard to increase production of their prepared compost.

The leading machine in the photograph is the Traymaster Spreader which is designed to give an even distribution of additives to the compost.

Following the Spreader is the second new installation, a Traymaster 2400 Turner, the largest machine made by this company for the United Kingdom market, capable of turning up to 110 tonnes of compost per hour.

Together the machines will improve the competitiveness and production capacity to ensure that Burcros will continue to meet the demand from their customers for top-quality, prepared mushroom compost.

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equipment has been exported to the West Coast of America. From its modest beginnings, the firm last year reported a turnover of over £½ m.

John and Freda Bradfield have three children, Peter (18), Rhona (16) and David (13). Peter is spending one year on the Catfield farm before taking a three-year horticultural course prior to joining Catfield Mushrooms for good.

They all live in nearby Bleak House, Dickensian by name but certainly not in appearance. This 15-roomed former farmhouse stands in an acre of ground.

This story of the Bradfield brothers is one of success — of that there is not the slightest doubt.

CATFIELD TEN YEARS OLD

The Yarmouth Mercury of 20th July 1979 records that 'one Norfolk farm has turned out a total of 6,150 tons of mushrooms in the past ten years, and paid its staff more than a million pounds in wages to produce and harvest 500 crops. At a celebration to mark its ten years' existence, 13 employees of Catfield Mushrooms Ltd. received gifts to mark their service over that decade, and two others received 15-year awards, having worked with Catfield's founder, Mr. John Bradfield from Martham. The awards were made by Mr. Bradfield and his wife Freda at a celebration dinner at the Sutton Staithe Country Club. The employees presented Mr. and Mrs. Bradfield with a gift of hand-made, engraved, crystal glass.'

BARRY HOWES

Barry R. Howes, a director of Salliota Ltd. in Sidlesham, Chichester, is this year's chairman of the Mushroom Industry Conference Committee, led for the past decade by John Bradfield. With Jenny Walton and the locally-situated MGA chairman, he looks forward to exciting days in Great Yarmouth in October.

When the Editor asked him what he did before he went into mushrooms he said his working life started with a 'most enjoyable' two years' National Service with the RAF, mainly flying, with a spell in Air-Sea Rescue. Back in 'civvy street' he accepted a job in electrical engineering with a firm specialising in automation and spent five years studying at evening classes to qualify. He continued:

'Having designed an automatic control system for the Sugar Puffs plant at Quaker Oats Ltd.

I was offered a job and I spent four years with them as Electrical Engineer. With an engineering department of some 80 strong, covering most trades, I have found this very valuable in recent years.

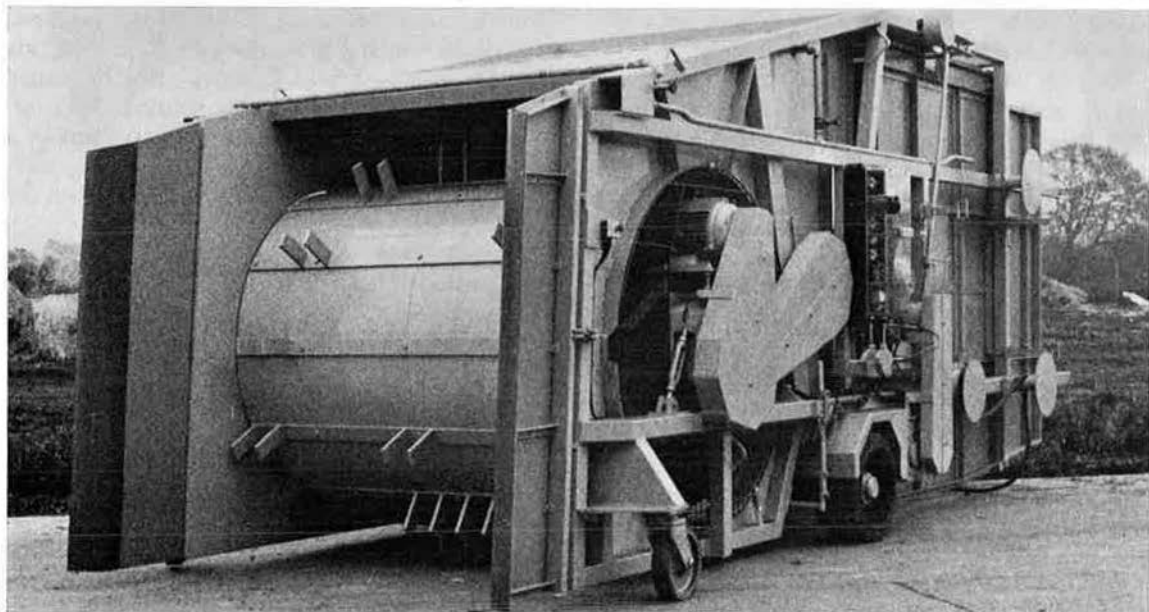
'Out of the blue, my present co-director, Mr. T. Thistle, who had sold his previous business, suggested starting a mushroom farm with my brother-in-law, David Bullard, who had been with Mac Bulloch for a short spell. We purchased an eight-acre site on a main road in a rural part of Sussex, very close to the sea, with Raymond Thompson and Sammy Sampson for neighbours.

'Apart from my work on the Conference Committee, I am South-East Area chairman and a member of the Publicity and Marketing Committee. I have derived a great deal of pleasure from my membership of the MGA, through which my wife and I have made many good friends.

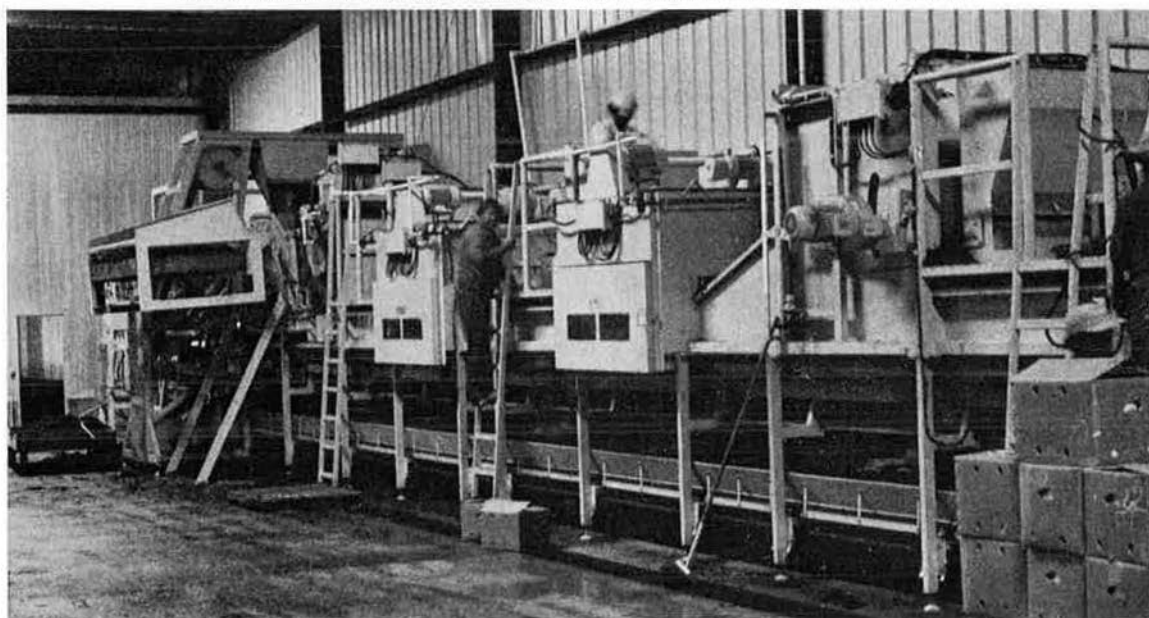
'When away from the farm, I take an active interest in local affairs, and my hobby is yachting.'



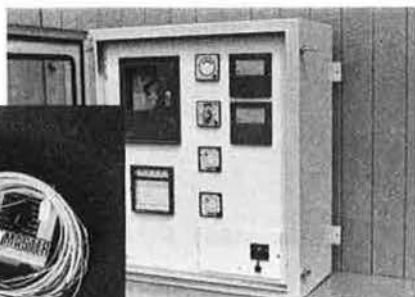
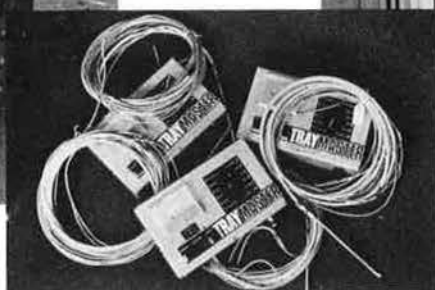
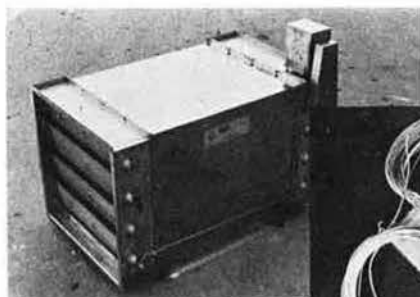
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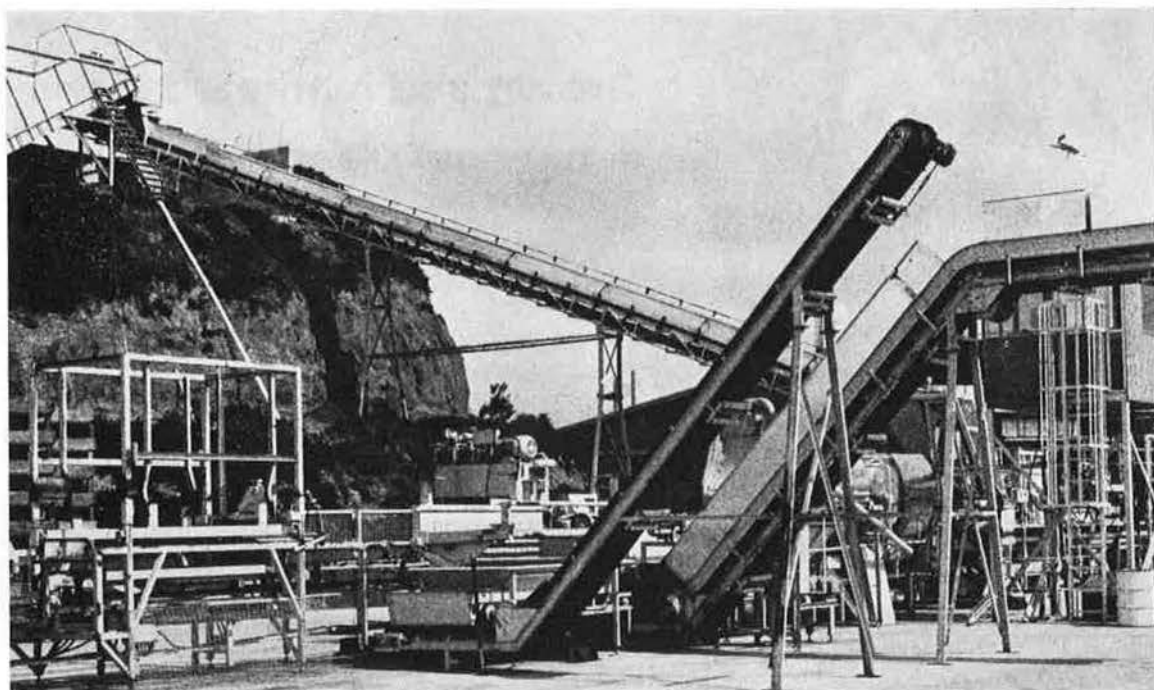
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Winston Alderton was there . . .

ALLIED TRADES DEFEAT GOLFING GROWERS

Two players hole in one

For the first time since the inception of the annual golf match between a team of Mushroom Growers and Allied Trades, the latter won in an exciting finish by four matches to three with the outcome in doubt until the final match.

This annual meeting was all the more remarkable because two players did a hole-in-one. They performed this feat at the same hole — the 160-yard ninth — and in both cases Anona Straker from Baddow Park Mushrooms witnessed the event.

The first hole-in-one was performed by **Gordon Batchelor**, his tee shot pitching direct into the hole during the morning's Stableford Bogey competition over ten holes. The eventual winner was **Barry Woodcock** of the 'Traymaster' organisation after a count-back with the runner-up, **Margaret Lister**.

It was in the four-ball Match Play over 18 holes in the afternoon that **Paul Maxwell**, of Cheshunt, also did the hole-in-one, his lofted tee shot pitching a little short of the green but running on into the hole.



Walking towards the ninth green are (left to right) John Maxwell, Margaret Lister, Tony Russell and Ruth Powl



Simon Fleet, captain of the Allied Trades' team, receives the Hensby Cup from John Bradfield

There was considerable excitement in the early evening when the match result for the Hensby Trophy depended on the outcome of the final match in which Gil Edge and Simon Alderton defeated the MGA Vice-Chairman, Peter Cracknell, and John Speller, by two up and one to play.

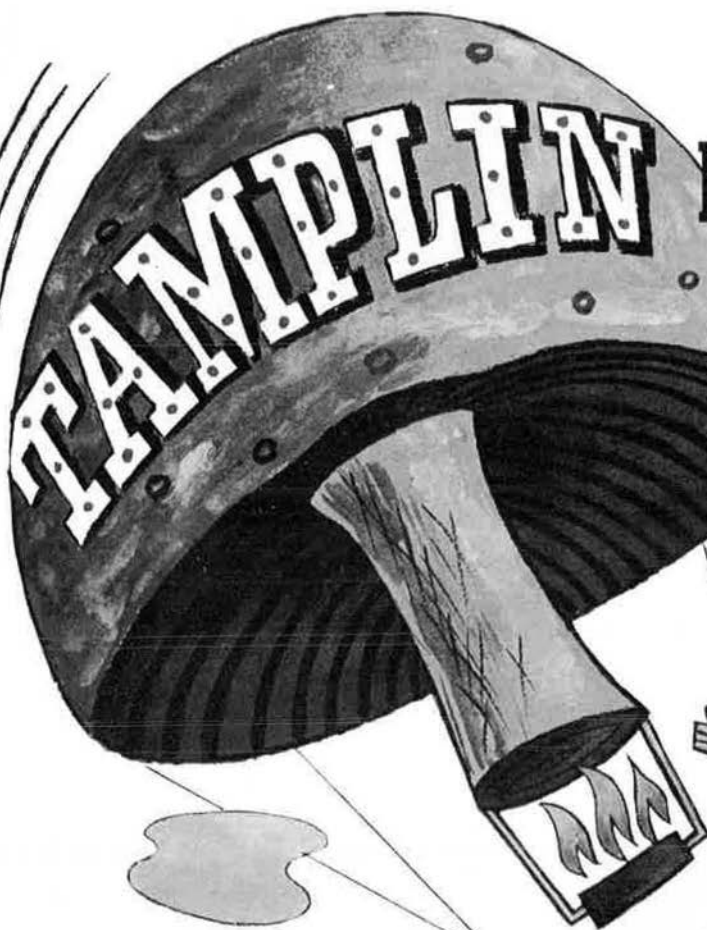
The prizes were presented after dinner in the Clubhouse by MGA Chairman, John Bradfield, who was accompanied by Mrs. Bradfield.

Ferd Hensby, donor of the trophy and the commemorative individual cups which went to the winning team, remarked, in introducing John, that this was the first time an MGA Chairman had been present at this event. Earlier, the main speech had been given by Simon Fleet, the Allied Trades' captain. He warmly thanked Mr. Hensby for his generosity and for organising the match, including, as is customary, champagne at the halfway stage during the main match, dispensed by Joan Cracknell and Brigitte Golding.

The match took place in glorious weather at the Newmarket Links course on Thursday, 12th July. This annual event is always a splendid MGA social occasion and it is a pity that more non-playing members do not provide a gallery to urge on the opposing players.

With Dr. 'Jim' Sinden captaining the Allied Trades' team in 1980, plus a suggestion that the next match might take place in Switzerland, maybe in connection with an MGA Study Tour, more 'outside' support will be forthcoming. John Maxwell, who kindly supplied the after-dinner port, will captain the Growers' team.

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Fred. Atkins reveals that . . .

SINDEN BEGINS TO RELAX

It is announced that **Dr. James W. Sinden** has retired from the Board of Directors of **White Queen Ltd.**, the spawn plant at Yaxley, near Peterborough.

The Board, mindful of the extremely valuable contribution he has made to the Company in particular and to the Mushroom Industry in general, has offered him the Presidency of the Company and expresses delight at his acceptance of this office.

That is the essence of a Minute from White Queen's AGM in July. But a little more must be added.

I was privileged to be there when he first came to England with **Mrs. Erica Hauser** in September 1948 and, at my Yaxley farm, he was appointed a Life Honorary Member by the current MGA chairman, **Stanley Middlebrook**.

The group photograph taken on that memorable occasion illustrates Jim's manifest surprise at the widespread use in the UK of subsoil for casing. Examining a clay seam were (left to

right) **Ron Edwards** (director, Mushroom Research Station), **General Sir Oliver Leese** (MGA vice-chairman), **Fred. Atkins**, **Percy Major** (MGA hon. treasurer), **Stanley Middlebrook**, **Jim Sinden** and **Erica Hauser**.



Jim, in his 77th year, is speaking at the first North American Conference this month and at Great Yarmouth in October, and has just been elected captain of the Allied Trades' Golf Club. What a remarkable man!



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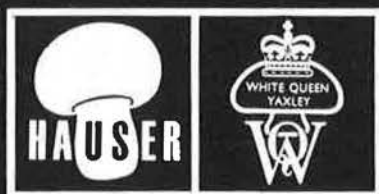
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MGA CONFERENCE PROGRAMME

Great Yarmouth: 10th-13th October

You all know that this year's National Mushroom Industry Conference is being held from 10th to 13th October at Great Yarmouth on the Norfolk coast. The Conference Office at the Carlton Hotel will be open for registration from noon until eight on Wednesday, 10th October.

As last year, the sporting competitions will take place on the Wednesday. The Clay Pigeon Shoot will take place in the morning; further details will be available nearer the time.

The Golf Competition is being played at Caistor Golf Club that afternoon. It will be possible to enter both competitions.

The Squash Competition is being held at Gunton Park Squash Club from two until five o'clock.

Several members of the Allied Trades will have small displays in the Conference Hall — so there will be plenty of opportunity to meet old friends and make new ones.

The full programme is shown below together with brief details of the lectures. We will do our best to provide you with full copies of the text of each lecture after its presentation.

We have speakers from the UK industry as well as from the Continent.

We are also expecting friends from Overseas to join us, as well as a large number of UK Growers.

The provisional programme

Wednesday, 10th October

Morning Clay Pigeon Shoot.
14.00–17.00 hrs. Squash Competition at the Gunton Park Squash Club.
14.00 onwards: Golf Competition at the Caistor Golf Club.

The Conference Office at the Carlton Hotel will be open for the registration of delegates from 12.00–20.00 hrs. on Wednesday.

19.00 hrs. Mayoral Reception at the Carlton Hotel.

Thursday, 11th October

09.00 hrs. Ladies Outing — Trip on the Broads in the *Southern Comfort* followed by an afternoon in Norwich.

09.15 hrs.

Chairman's welcome to delegates.

09.30–10.20 hrs.

Lecture: **Dr. R. R. Frost** of the University of Manchester: **Mushroom Viruses — Do They Cause Disease?**

A review of the evidence that mushroom viruses cause diseases in mushroom crops — together with discussion of the possible explanations for the scientific findings to date, with reference to the viruses that are now known to exist in more than one hundred other species of fungi.

10.20–11.10 hrs.

Lecture: **Mr. Hugh Owens:** **Mushroom — The Unrivalled Market.**

A look at trends in sale and consumption to influence our market approach.

Chairman:

Mr. P. H. Cracknell.

11.10–11.30 hrs.

Coffee.

11.30–12.20 hrs.

Lecture: **M. Jean Laborde** of the Station de Recherche sur les Champignons, Bordeaux: **Rapid Techniques for Making a Pleasant and Productive Mushroom Substrate: Where Do We Stand Today?**

Not quite an instant substrate but a quick production technique resulting in a growing medium for mushrooms which is altogether homogeneous, dense, acceptable, and as productive as a good traditional compost.

12.20–14.30 hrs.

Lunch.

14.30–15.20 hrs.

Lecture: **Mr. Jim Gooding** of James A. Gooding Ltd.: **Water — Friend or Foe?**

Chairman: Mr. P. J. Middlebrook.

15.20–16.10 hrs.

Lecture: **Mr. F. Hardiman** of Bord Na Mona: **Moss Peat for Mushroom Production.**

This lecture will cover the production, harvesting and processing of Irish Moss Peat for use in mushroom growing. REFERENCE WILL BE MADE TO THE FUTURE SUPPLY POSITION. The properties of moss peat which make it ideal for casing will be discussed, as will the variations in casing mixtures used.

Chairman: Mr. Peter Munns.

16.10–16.30 hrs.

Tea.

- 16.30 hrs. Lecture: **Mr. J. B. Lockwood** of Minskip Mushroom Farm, Boroughbridge: **Aiming Towards Cheaper Growing.**
A grower talking to growers about his methods of composting, and experiments on new cultural methods.
Chairman: Sqdn.-Ldr. P. J. Hearne.
- 19.00–20.00 hrs. Overseas Reception.
Disco in the evening.

Friday, 12th October

- 09.30–10.20 hrs. Lecture: **Dr. R. G. Steane** of Hearne House Mushroom Farm: **Observations on the Cultivation of *Agaricus bitorquis*.**
The advantages and disadvantages of growing *Agaricus bitorquis*, the 'hot weather' mushroom, are discussed, together with observations on some aspects of the growth of this species.
Chairman:
Mr. R. H. Pinkerton.
- 10.20–11.10 hrs. Lecture: **Mr. John Weeks** of the Health and Safety Executive: **The Health and Safety of Mushroom Workers.**
A look at various aspects of the 1974 Health and Safety at Work Act — with particular reference to the more important requirements of the Act for employers involved in the business of growing mushrooms.
Chairman: Mr. J. H. Green.
- 11.10–11.30 hrs. Coffee.
- 11.30–12.20 hrs. Lecture: **Dr. J. W. Sinden:** **Is the Mushroom Grower an Endangered Species?**
A discussion on some of the obstacles the mushroom grower is going to have to face and overcome in the next few years.
Chairman: Mr. C. J. Bradfield
- 12.20–14.30 hrs. Lunch.
- 14.30–16.10 hrs. The Annual General Meeting of the Mushroom Growers' Association.
- 16.10–16.30 hrs. Tea.
- 16.30–17.15 hrs. Business Session.
- 19.00 hrs. Trade Reception.
Disco in the evening.

Saturday, 13th October

- 08.30–13.00 hrs. Farm Visits.
- 14.30–15.20 hrs. Marketing and Publicity Session.
- 15.20–16.10 hrs. **The Sinden Award Lecture.**
Dr. W. A. Hayes: Ecology, Resources, and Mushroom Cultivation.
The Lecture will explain the ecological principles of mushroom cultivation, which itself is almost a perfect ecological model, and emphasis will be given to those factors which are not only *immediately relevant* but also to those which are likely to be critical *during the next decade*. Resources, particularly Energy and Materials, will figure more prominently in the future and even the broader issue of the justification of mushroom cultivation — a costly and wasteful process — must be re-considered in a changing world of declining resources.
Chairman:
Mr. R. C. A. Thompson.
- 16.10–16.30 hrs. Tea.
- 19.00 hrs. Chairman's Reception.
- 20.00 hrs. **Closing Banquet.**

GEOFF GANNEY and his

GROWING PAINS

1st June 1979

Pleased to receive clean bill of health from the samples sent to ADAS for monitoring for virus. Having adjusted our after-crop sterilisation techniques in order to save as much energy as we can, we shall need to monitor for virus more frequently. Oil is still a problem to obtain and, as we have had the 15% reduction enforced on us, this looked an obvious area to work on.

4th June

Had major programme to replace fork-lift trucks. We have had several types down to try, both for manoeuvrability and robustness. The speed of work and uneven surfaces quickly knock the newness out of trucks. Solid tyres to prevent punctures are a must and this leads to a

certain amount of jarring. One trial truck lasted a complete morning before the engine mountings snapped clean away and the engine lay between the wheels! Never happened before, we were calmly told . . . !

5th June

Cottonseed meal ran out and had to chase up the delivery, but it meant putting CSM in at last turn. Most unhappy in that such a small amount put in late is unlikely to get evenly mixed. Also the ammonia content of the compost appears to be higher.

6th June

Peat still a problem to get hold of and one wonders if there will ever be a return to normal supplies of peat or anything else. Becoming more and more convinced that we shall be digging soil in the not too distant future — should improve the weight factor in the casing layer if not the quality of mushrooms.

7th June

Had third flush that formed up normally but just prior to the picking stage the stipe peeled back like a banana skin! We had not used any chemicals but certainly had put plenty of water into the beds. No doubt due to some transpiration problem!

8th June

Been reading a couple of articles on growing in deep beds on single layers — seems reasonable idea and should produce extremely heavy yields per unit area — not sure about economics as it is early days yet. Wonder how much the compost dries out with the air passing through all the time — or if that is very important.

11th June

Transporting cased trays from one farm to the next is causing problems during the dry weather. The major enemy of disease control — dust — is dragged up by tractor wheels and is both being sucked into ventilators and settling on the casing layer. Spraying over the roads with formalin has been carried out but whether this helps it's a job to tell as, once the surface is dry, up comes the dust. Must check pickers aren't sweeping dry floors.

12th June

Had yet another discussion on whether to build a 'tunnel' for compost preparation at Marigold! As usual, became less enthusiastic

as the discussion progressed into the realms of eelworms, virus, truffle and other possible moulds. We are probably too cautious — or is it the initial cost of the project that frightens us? Still hear of growers using tunnels and having problems of various forms; perhaps, as with peak-heating, there is still plenty to be learnt and a high degree of practical skill required. It is very easy to make a system too complicated to run while having to think about 101 other things.

13th June

Contemplated setting out F.H.D. Scheme (grant scheme!) but the complications in both gaining approval and then planning ahead for several years were too much. Having spent many years dealing with various Government schemes I can see how growers can easily be put off by such complex matters.

14th June

Found some *Megaselia nigra* larvae tunnelling into mushrooms just where the light penetrates the open doors. Pickers need to keep doors closed during warm weather to keep flies and heat out. Continual battle to keep them doing what is laid down as the correct procedure.

15th June

Compared crop records using the same compost at Yaxley and Marigold and the cropping graphs follow an identical pattern with highs and lows following one another. Only trouble is there is a big gap between the yield lines! But, barring other major catastrophes, the quality of the compost (as we would expect) is the governing factor concerned in potential yield.

18th June

Great glut of mushrooms on the market being sold (virtually given away!) at ridiculous prices. Decided to throw away opens and second-grade material in a hope of getting reasonable prices for cups; unfortunately other growers are still putting rubbish on the market. No doubt in my mind we are in for a period of low prices and escalating costs.

19th June

Sudden build-up of flies during warm weather and with some *Verticillium* about this is worrying. Treated most sheds with pyrethrum to reduce sciarid population to low level. Found

odd flies (odd few not odd *odd*) making entrance into peak-heat rooms by way of exhaust ventilators. Considered treatment prior to spawning. Also had to clean up fly netting — which was restricting air in and out of growing sheds. Using Dimilin as routine watering of beds after casing in order to hold the second generation in check which when laying in the casing can cause considerable loss by the 5th week. Although costly, a single application saves time and is probably not more expensive than several applications of other chemicals.

20th June

Started laying concrete at Marigold to enable us to use a large power fork on the front of a fork-lift to fill manure in the line hopper. Uneven filling has been giving some problems at Phase Two with lack of conversion of over-filled trays. Should have the system operational in a couple of weeks and can then consider using the press as well. Although not too sure about pressing with fixed long legs for peak-heating — maybe too much air movement.

21st June

Oil increases since January have resulted in 44% increase in unit cost and we now await the snowballing effect on packaging, plastics, chemicals, etc. We will need some considerable price increases this autumn and winter to compensate for such cost increases, and doubt that we shall see this happening.

22nd June

Two dozen bed-thermometers arrived and as we normally do we placed them all in a bucket of ice and water to see what discrepancies there were. Between the highest and lowest was a range of 8°F!! In order to have some accuracy we had to discard 6 thermometers to keep a range of 2°F variation. Perhaps we were unlucky or buying too cheap a type? A bit of difference between this variation and the half-a-degree quoted for work in tunnels!!

25th June

Tremendous first flushes at Yaxley well in excess of 2 lb./sq. ft. of good quality, heavy, mushrooms. Putting a strain on picking. Shall have to recruit more pickers before holidays get under way.

26th June

Having reduced casing moisture to get an even

flow on the line it has meant earlier waterings. These are done carefully in order to avoid moisture running through to the compost. Probably a good thing to cut moisture level with the dry crusty layer on top of the compost or we could find a black, dead, zone forming, so reducing the strength of growth into the casing.

27th June

Increased watering to compensate rapid drying-out; the extra air and low outside humidity have greatly increased evaporation. Some sheds were watered late which resulted in a corky zone at the base of the casing layer. Tanked with some soft soap in the water to aid breakdown of surface tension and penetration to the parts water never reaches! A good story, anyway.

28th June

Trying to improve crop costings in order that we not only know when we are losing but by *how much* we are losing! By building in target figures and inflation we should gain a more realistic appraisal of the true economics of mushroom production. It certainly is not anywhere near as good as some people seem to imagine and because a few weeks in the year wholesale prices *appear* to be high there is little reason to imagine mushroom growers are over the moon.

29th June

Have suspicion that first flushes affected by Dimilin treatment! Maybe we put it on too late, but the size of mushrooms is reduced and they are quite patchy. Have to observe more closely — old problem of chemicals in the casing and the varying effects that can occur due to strain, temperature, mineral content of the casing, etc. Of course, it may not be Dimilin but purely the affect of wide differentials in day and night temperatures?

30th June

Dropped Benlate from the casing at Marigold to see if there is any difference in the pattern of *Verticillium*. Probably get some of the *Mycogone* back, or maybe the site is now clean enough to get away with not using it. Continued use of chemicals is never acceptable on mushroom farms. Have a feeling we may have *V. psalliotae* as we are finding a number of grey sunken lesions on the stipes — must have a word with John Fletcher.

MGA STUDY TOUR OF NORTH AMERICA

RICHARD GAZE

MAFF/ADAS National Specialist in Mushrooms

Dr. Stoller prefaced our visit to his farms by words to the effect that we had seen a lot of mushroom farms and what he wanted to show us were things we had not seen elsewhere; and he did indeed have many things to show us which were very different from anything else we had seen. For this report of the April-May study tour I should like to borrow his approach rather than attempt a comprehensive narrative of all the farms, with the resultant catalogue of procedures, buildings and equipment. I have selected specific items which were of personal interest or novel to me.

To a first-time visitor to North America nothing had quite the impact or left such an impression as the shelf system of the traditional 'American Doubles'.

We saw variations of the system on the farms of Castle & Cooke and Grocery Store Products, but it was apt that our first visit, to Irving Slack's farm, uses this method of growing.

One's first impression of a growing room, on looking into the doorway, is of an enormously tall building fitted with a tangle of interlocking timber, which slowly resolves itself into tier upon tier of wooden shelves, six, seven or even eight high. The shelves are 6 ft. wide and in four or occasionally two rows. Perhaps the most fascinating aspect of the shelving is the catwalk

half way up the tiers which effectively turns each room into two separate chambers.

Lighting in the rooms is poor or non-existent and one's admiration for the pickers' agility great, particularly as some of the catwalks are reached by spartan, vertical ladders and consist of a single board down each aisle which is effectively more of a chasm than a pathway.

For the most part these shelves are run as a single-zone system and are peak-heated and spawn-run *in situ*. Compost is fed into the houses on conveyor belts, boards for the second shelves being put in place when the bottom shelves have been filled and the third after the second and so on. Spawning, casing and tamping



John Swayne has kindly sent us this photograph of some of those MGA members who went on the North-American Study in May. With coach driver and staff members are (left to right), standing: Eric Patterson, Joe King, Colin Moore, Jeff Green, Richard Gaze, John Stewart-Wood, Peter

Bradfield, Stella Green, Negley Groom, Barbie Stanley-Evans, Jim Dales, John Bradfield, Ron Jones, Trevor Smith, Donald Bradfield and Jim Tolhurst. Closer to the ground are Dickie Lunn, Denis Locke, Peter Stanley-Evans, Roderick Beardsell, Ferd Hensby and John Swayne

are done by hand with perhaps the aid of rotary 'super diggers' to help with spawning.

Irving Slack has begun to mechanise his shelves and now peak-heats in separate rooms which are filled and emptied with nets adopted from the Dutch. This innovation of course overcomes the problem of spawning *in situ* and further adoption of Dutch technology has enabled casing to be done by again using nets then which pull the casing layer over the beds and drop it as they are rolled back on themselves.

Moving peak-heated compost is clearly a worry and on Slack's farm an attempt to overcome the risk of infection, particularly from virus, has been made by feeding the compost into custom-built lorries which blow filtered air up through the falling compost.

These adaptations of the traditional system were the only major changes we saw with the exception of two experimental, bulk preparation, tunnels to peak-heat and spawn-run 160 tons of compost which we saw in California. This was a little surprising in some ways but quite obviously the American shelf system is so well tried that change will be absorbed slowly and cautiously. As either an endorsement to its present viability, or at least as a major act of faith to that effect, one of the Californian farms was engaged in a major expansion scheme, building houses of two stacks, 8 tiers high in the traditional manner and which will increase production from 10.5 million lb./annum to 15 million lb./annum.

Some at least do not consider it to be an obsolete growing method.

Trays

Seven of the eleven farms we visited were growing in trays. Not unexpectedly in a timber-rich area they were on the whole well if not massively built. Some woods unfamiliar to us were used and I noted Hemlock and Douglas Fir amongst others. One farm was using trays of treated Yellow Pine with Oak side boards. California Mushrooms at Whittier had some trays made completely of plywood except for the legs. They were 4 ft. 6 in. square and constructed of exterior quality ply, the base of the trays being one panel through which rows of holes had been drilled.

Del Norte Foods at Oxnard had a similar design but there the ply was mounted in a galvanised steel frame instead of being fixed to wooden legs. The steel legs which were part of

the frame were 6 in. long downwards and 3 in. upwards and fitted together with a ball-and-socket joint. Although the initial operation seemed rather finicky, this design appeared to be most durable.

We were told that a renovation programme on the trays was commencing. This entailed renewing the ball-and-socket flanges on the legs!

Handling

Perhaps the most outstanding handling system we saw was associated with the steel and plywood trays seen at Del Norte Foods. Once stacked these trays were very secure, and equipment developed on the farm was in use to lift and transport 21 trays at one lift, in three stacks of 7.

Most tray handling was very similar to that seen on UK farms to the extent that often it involved lines from the same manufacturers as we use.

The ability to add water to the compost as it passed through the line may, of necessity, be better developed than on our own and this was well demonstrated by the tray line at Leaver's in Ontario which has a 'three bar option' for adding water.

Two lines stood out as different from the others and our own. That at Heritage Farms was the most solid, workmanlike, line that I have ever seen, whilst that at Dr. Stoller's Miranda Farm moved the trays at the greatest speed. After de-stacking, the trays shot along the line almost faster than one's eye could follow.

Compost

All the yards we saw were in the open and during our visit there was little hint of the problems encountered by northern growers, particularly those in Canada, during the winter. Compost stacks freezing and jamming turners at temperatures as low as minus 15°F are hard for us to imagine. At times, we were told, steam lines had to be placed in the stacks to get them going and, not surprisingly, peak-heating at that time of the year takes up to 13 days. Presumably much of Phase I is, in practice, carried out in the peak-heat rooms.

At the other end of the scale, conditions in summer in California are extremely drying and at Castle & Cooke's Ventura farm this seemed neatly countered by cane mats placed at the sides of the stacks.

Composting is fundamentally the same the world over but perhaps the most intriguing aspect of the North American yards for us was the variety of some of the compost ingredients.

All the raw materials we use were seen and, in addition, oat and barley straw, corn cobs, cottonseed hulls, peanut meal, soya meal and grape pomace. The latter is the solid material remaining after grapes have been crushed for wine-making and is thought to be a deodorant.

Composts ranged from 100% stable manure to 100% synthetic, with 15–50% synthetic mixtures in between. Where synthetic was a part rather than the whole of the mixture it was commonly based on a hay-corn cob recipe. The hay was usually Timothy and more like a fine straw than our own softer, feeding type.

Whatever the ingredients, the end product was similar to our wheat straw-dung mixtures although some of the bed growers appeared to favour a heavy, short compost.

The Penn Green Turners developed at Penn Green Farm's composting yard were a novelty and worked on a principle unique to any turners that I have seen, clawing the compost up a huge ramp with a grab mounted on the turner. We unfortunately were unable to see one in operation but their likeness to some giant coprophagous mantis must be considerable.

Another innovation new to me was seen on the turner being used at California Mushrooms; this was a self-steering mechanism consisting of two forward-mounted horizontal wheels running along the stack.

The shelf plant of Grocery Store Products at Kennett Square demonstrated two facets of composting of considerable interest, one of which could perhaps be incorporated in yards here.

The immediate impression one receives of the farm is that of great spaciousness, each block of houses being separated from its neighbour by literally acres of concrete. On moving through the farm the reason for this slowly became apparent, for many of these open spaces were filled with compost at various stages of production. The system employed, probably for historical reasons, was a separate compost yard for each block of houses. The houses being filled only four times a year results in individual composting wharves presenting, for most of the time, the appearance of clean, uncluttered concrete.

Fascinating though this was it is clearly an expression of the American shelf-system, but an aspect of these wharves which seemed both ingenious and increasingly applicable to us was the sluices which either directed run-off water into the fresh water drainage system or, when composting was in progress, into collection tanks.

One or two eyebrows quivered slightly in another yard when it was discovered that the immense heap of spent compost in the yard was live and that a few feet away 'chogs' were being liberally heaped on to the pre-wetting stacks. What we couldn't do if we grew brown strains!

Casing

Contrary to expectations, probably quite unfounded expectations, 'dirt' was little in evidence, many of the farms using exclusively peat and limestone in their casing.

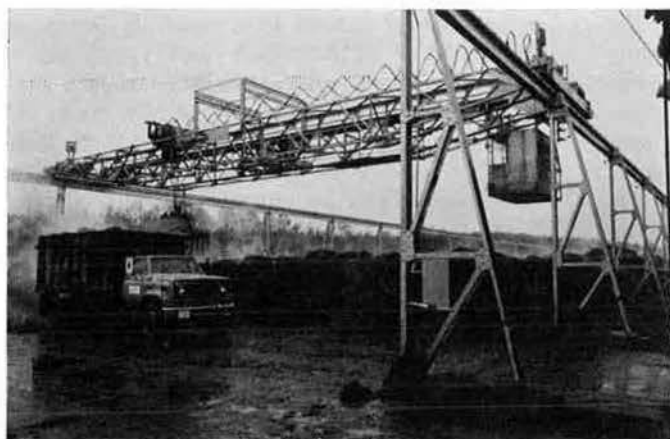
Soil was used on a few of the farms and this ranged from actual soil to 'decomposed granite', which looked like clay, via spent compost, re-used on a 10-year dumping cycle. The 'soil' content was from 30–50% of the total non-limestone content. The peat was exclusively Canadian, either New Brunswick or British Columbian.

The majority of farms were convinced that the peat carried eelworm — it wasn't clear whether saprophytic or pathogenic — although one farm, with ironically about the best yield, did not sterilise the British Columbian peat used.

The methods of mixing, often combined with sterilising, were ingenious and efficient.

Most farms employed concrete-mixer-type equipment either with a screw or paddle action and steam or steam-air mixtures which were introduced into the mixers. Dr. Stoller arranged for his paddle-type mixer to be emptied for our benefit and although it was hot the casing appeared to have a good structure after its double adventure.

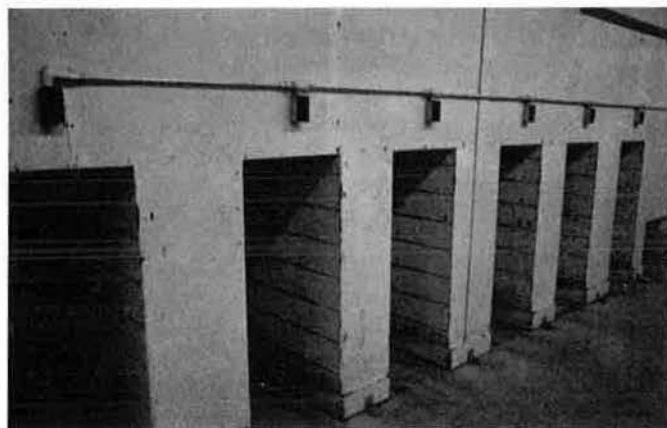
Several farms steamed casing in the backs of lorries which then transported it to wherever it was required. At Irving Slack's farm this system had been refined further and lorries were backed under a grid of vertical spikes which were lowered into the casing, rather like some of the old glasshouse soil-sterilizing methods. At this farm mixing was done with a machine resembling a small compost turner.



Overhead crane on Slack's pre-wetting area



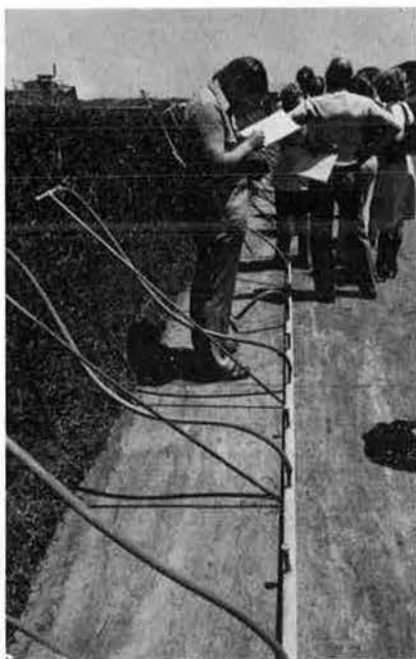
Cropping sheds and exterior ductwork at Castle & Cooke, Soquel



Cooling tunnels at Del Norte Foods, used after picking but before grading and packing



Sophisticated pre-packing machinery at Slack Brothers



Compressed air probes are used to aerate the compost after 2nd turn at Del Norte. Fifteen minutes every two hours

Temperatures and times quoted, or misquoted, for sterilizing ranged from 180°F for 4 hours down to 140°F for 40 minutes.

More interest was shown in this aspect of production by the party than might have been expected a year or so ago when our own peat supplies were more reliable and assured.

Spawn Strains

Next to the American shelf system, and perhaps the sheer scale of operations of some of the North American farms, the deepest impression left after a first visit must surely be the mushrooms themselves.

White, besides not being necessarily beautiful, was at times exceedingly unusual on many of the farms we visited. In fact although we may have seen some true-blue whites I'm afraid I didn't notice them. The white mushrooms we did see were predominantly 'off' or 'rough' whites, although white and smooth enough to deserve neither name.

Travelling from North to South and then West the shade darkened all the way, Rough White and to a lesser extent Cream in Canada, All Cream on the GSP farms in Pennsylvania to a predominance of Cream and Brown in California although, as always, at least one will prove otherwise and Heritage at Gilroy grow only Rough Whites.

The feeling we got in California was that perhaps the quantity of Brown strains grown had passed its peak and more Cream and White were being grown, but the Brown mushrooms we saw certainly left a deep impression. Apart from their size and weight and apparent ability to shrug off being treated like thick skinned potatoes with equanimity, they are attributed with many desirable qualities ranging from robustness to marginal cropping conditions, to resistance to virus, and better flavour.

Whilst my admiration for brown mushrooms is considerable and might, therefore, cloud an otherwise clear judgment, I am sure there is an opportunity for modest diversification in the UK, working on the principle that even if only a few Browns were grown they might find a market niche that would otherwise remain unfulfilled. It has been tried in several instances, unsuccessfully; perhaps ADAS's Lee Valley EHS with its reputation for successfully selling the unusual might be the place to try once more.

The 10 lb. boxes we saw at Whittier, labelled Fresh Hot House Grown Mushrooms, looked quite irresistible.

Another facet of strains and spawn production which quickly became apparent to us, accustomed to only three suppliers of spawns, was the fragmentation of production in North America. Beside the Europeans with whom we are familiar and several North American producers, four of the companies whose farms we visited produced all or part of their own spawn.

Yield

Not because there was anything particularly remarkable about yields but rather as confirmation of our own position and to satisfy an understandable and almost universal interest in this subject, it is perhaps worth mentioning that yields ranged from 3 to 4.75 lb/ft².

There are of course many qualifications which could be applied to these figures, of weight of fill, length of cropping and so on. The former required some agile mental arithmetic as most weights were quoted in dry matter but it seemed to me that scale, fill and all the other factors taken into account, yields were similar to those in the UK.

Picking

One of the intentions of the previous comparison is to highlight, by contrast, the differences we observed in picking rates. I am sure that to many of the grower members of our party, rather than to my more catholic self, this was the most vital difference observed on our tour.

Having made a special effort to avoid misreporting these figures and having deleted those rates attributed to 'pulling' for processing, let me quote you in full the figures we were given for average picking rates:

35, 50-60, 50-60, 60, 60, 60-70, 80 and 90 lb/hr.

There may be sufficient differences in circumstances to account for these high rates but I have yet wholly to convince myself.

The most usual rate quoted and also the actual average of the figures was 60 lb/hr. Rates in this country vary from 20 to 40 lb/hr., so that in very rough terms we could say that picking rates on the farms we visited were about twice as high as our own. The different circumstances prevailing in the two areas are of course considerable. Virtually all the picking staff was male; only at Leavers did we see women

pickers, and those were not Canadian. All the remainder with the exception of Slack's were either Puerto Rican or Mexican men.

Off-white, cream and brown mushrooms tend to be larger and/or heavier and all those we saw tended to be reasonably well spaced on the beds.

Several farms allocated gangs of pickers to a group of houses resulting in only one gang picking all the flushes of a given crop and picking organisation was clearly good. A common system is to pick into 3 lb. boxes fitted four to a wire crate, the crates being stackable, robust and easily transported.

Some of these differences, which must be construed as advantages, were surely offset by the difficulty of actually moving in and reaching mushrooms from 6 ft. wide shelves in long houses or from trays stacked seven and eight high.

Grading standards were certainly different also and I suspect if all servicing and pack-house staff were included, the average could be pulled down slightly. If there is any conclusion to be drawn from this mass of apparently contradictory information it is perhaps a combination of the strains, good organisation and — probably most important of all — the almost feverish, highly motivated activity of the pickers.

Whilst on the subject of picking one must mention the picking trolleys seen at Del Norte Foods. These are difficult to describe and not easy to photograph in use but in simple terms they consisted of a two-part trolley. One part which carried the filled boxes of mushrooms in several tiers was fairly conventional and was used to carry boxes in its own right when the picker was picking from the ground. When picking began on the upper trays, they were stacked seven high, the trolley was drawn up on to another larger trolley which acted both as a chog bin and picking platform. It looked efficient and the highest rate quoted was from this farm.

Marketing

We saw a lot of mushrooms which were destined for canneries and several of the farms had a direct interest in this side of marketing, but the majority of those we saw being grown were to be sold on the fresh market.

The proportion of fresh to canned was growing and of this fresh produce the majority again was in market packs, usually of 10 lb.

All the overwrapped packages were pierced at punnet level as an anti-botulism measure. Most mushrooms were sold as closed and barely-open cups; flats were very little in evidence. Some of the cups were very large, this being the premium character for price, 'Jumbos' commanding the highest price of all. In Canada one can buy mushrooms by the pint although I failed to understand quite what constituted a pint in this context.

Farm Size

To put our visits into perspective and to mention another factor of some considerable interest, some consideration of the size of the farms we saw might be appropriate.

Measurement of size is always a vexed question. Should it be static area or production capacity. This puzzle is heightened when different systems of growing are involved. Most of the farms quoted us a weekly filling area and for those that didn't I have made an attempt to convert. The areas involved are so formidable that I have, for amusement, listed them all: 7,000, 15,600, 20,000, 25,000, 29,000, 30,000, 34,000, 45,000, 50,000, 52,000 totalling per week 307,600 ft.², which is quite a lot.

Kennett Square

Although the farms we visited ranged from medium-large to enormous, by our standards, we were lucky enough both to travel through and to have John Swayne's running commentary of the Kennett Square mushroom-growing area.

In some ways one might say that the farms we visited were not typical, for 60+ % of the US production is still centred on a 25-mile radius of Kennett Square and consists of five to six hundred farms, many of them small.

Kennett Square itself seemed to be a town composed entirely of mushroom farms, each farm based on two or three 'American Doubles', each double holding about 8,000 ft.²

Traditionally these farms have grown only two crops a year but many have now begun to grow three. Much of the work is contracted out, starting with custom compost which is filled, cased and emptied by contractors. Air conditioning is minimal but John Swayne told us that yields and quality were very good.

As part of this story we were able to visit the custom compost yard of Penn Green Farms at Avondale which produces 60-70,000 tons annually for the small growers in the area.

The huge yard, lagoons for re-cycling, and sleeping herds of turners gave us some indication of the scale of the operation; and the emptiness and tranquillity of the yard demonstrated the seasonality of the system, most of the growers presumably having just completed their spring fills.

Pest and Disease Control

We saw little disease apart from blotch and few pests, but I think our general impression was that we wouldn't want to be encircled by the US pesticide legislation when faced with a bad attack of something — in particular, flies.

Sciarids we were told were the major problem and with no casing admixture and, as yet, no compost one either, we could appreciate the problem. The sciarid suffered from is *Lycoriella mali*; how this compares with our *L. auripila* I don't know.

One farm trapped flies, for indicator purposes, on a ceramic tile coated with the delightfully named 'tanglefoot'. Another seemed to have sprayed all its buildings with the stuff turning the whole place into a giant flypaper, covered in everything from humming birds to hoverflies. Another neat looking flytrap consisted of a circular Mercury vapour tube surrounding a revolving disc which attracted and then drew the flies into a polythene bag suspended below.

Those with a nose for the macabre saw very slight traces of most pests and diseases, but, for the most part, the farms were very clean with the exception, as has been said, of bacterial blotch.

I felt quite at home on one farm, being told that 150 ppm chlorine had cured the blotch problem, only to see a more-than-average amount in the packing shed.

R & D

As we did not visit any of the Research Establishments we saw no research as such, but on several farms development was in progress and discussed, notably at Dr. Stoller's.

He told us of his experiments with paper and activated carbon as casing and some of these we were also able to see at his Ariel farm. Another project under way was the immediate re-use of spent compost as a casing, the problem of high salts being overcome by soaking in a pit. The very wet, leached, compost is then transferred to a mixer-pasteuriser via a sludge thickener — an adapted piece of equipment from



Pre-wetting at California Mushrooms, using a lagoon of water



View of the manure yard and some of the cropping sheds at the vast Castle & Cooke plant at Ventura

the pineapple industry which removes most of the water.

We were also shown mushrooms growing in rows as a result of grooves left in the casing layer by a slatted former. It was claimed that this had the effect of extending the first flush forward by a series of parallel 'border' flushes in the grooves and a normal first flush on the ridges which facilitated picking.

At another Californian farm we witnessed a trial attempting to automate watering by means of narrow layflat tubing laid along the surface of the casing, which looked interesting.

John Rodwell told us of some of the ideas he was currently working on; these included alternative casing materials, compost mixers rather than turners, and a single-zone trough system.

Miscellaneous

On a tour of this nature one returns with large general impressions, which I've attempted to describe briefly, and also with recollections

of little disjointed items which remain in one's memory.

At Del Norte Foods a simple but memorable thing was the console at the door of each house which looked like a miniature traffic light. Each light, which was of a different colour, indicated quite clearly whether fans, coolers, steam, etc. were on or off. At the same farm a watering mast was in use.

California Mushrooms had overcome the problem of opening large peak-heat-room doors with a lifting system, running on rails, which had been adapted from the timber trade. The very large single doors, being statically hung when closed, gave a good seal which would not have been achieved had they been on runners.

Several farms used Spawn Mate and spoke well of it, making one wonder, again, why we have not been able to use it.

My final reflection on all the varied and

interesting things we saw is of the varied uses to which lorries were put. In addition to those in which casing was pasteurised and the mobile canteens which appeared miraculously at all the farms, lorries were used to accommodate mobile steamers and enormous coolers, others were equipped with tanks and sprays to wash down the concrete and another trundled quietly around, brushing the floors like a lonely council lorry that had strayed through the gate and couldn't find its way out again.

ACKNOWLEDGEMENTS

Despite the thanks already accorded, both officially and informally, to those who received us in North America it is fitting, I think, on behalf of the MGA in general and those on the tour in particular, to record once more and publicly our thanks.

Denis Locke we thanked in Los Angeles for always getting us to the right place at the right time, although not always in the planned way. For that and for the laborious task of arranging such a tour I would again thank him and Jenny Walton.



Ingenious mobile hydraulic clamp at Del Norte, moving three stacks of trays simultaneously



Automated machinery for making up cardboard 'outers' using quick-drying glue at Castle & Cooke



Cropping sheds and air-conditioning ductwork at California Mushrooms



Air-conditioning equipment on the roofs at Castle & Cooke, Ventura

SOME LIGHT-HEARTED

MEMORIES Sylvia Hensby

The fun started at Heathrow. With typical determination, Ferd took his golf clubs in case opportunity presented itself. For umpteen thousand miles, on numerous aircraft and countless coaches, he could be seen, oblivious to the comfort of his spouse or the safety of their luggage, pursuing his clubs to their place of rest — and taking his seat only when their safety was assured. It paid off — he played Pebble Beach!

When we arrived in Canada, the difference between our two continents was immediately apparent — red-winged blackbirds, enormous steaks, and clean washrooms.

It was after the ladies in the party visited the Clairol factory (begowned and mop-capped fetchingly in paper) that Corrine Groom made her fatal error. As every old wife knows, to pour tea from your hostess's teapot has predictable consequences. She laughed at our dire warnings . . .

Talking of tea (and I frequently do) I ordered my first pot in Philadelphia. 'Make it a big one,' said I. In struggled a waiter burdened by two beakers, a gallon thermos of water, forty tea bags, and enough sugar cubes to sink Jamaica without trace. They do things BIG in the USA.

Niagara Falls was a mad rush between planes. Nine intrepid warriors made the 200-mile round trip between 6 p.m. and midnight to view this wonder. It was marvellous! It was wet! It was cold and dark! It was like Blackpool (with apologies to Blackpool!) But the lobster dinner was magnificent. Incidentally, Toronto claims to have the highest building in the world — I can well believe it!

I remember our landing at Philadelphia, made by a circus pilot apparently bent on our destruction. Ron Jones's face was a study in pure terror. Once safely on terra firma, the party split into two — half to the nearest bar, the other half to the ditto washroom.

On to San Francisco, where the streets are at 45 degree angles, and a ride on the trolley cars is similar to being squeezed into a perpendicular sardine can whilst hurtling down the production line to an accompanying smell of burning. It was here that Peter and Joan Cracknell were politely requested to 'get the hell out of the

elevator' on the 21st floor, as we were having an earthquake. They thought it was a publicity stunt for the tourists!

During our extended tour of Northern California in search of a winery (take a map next time, Denis!) a nameless terrorist deposited an enormous cactus on the seat of our Heinz executive. Contact was made with predictable and agonising consequences, and Trevor retired that evening armed with a pair of tweezers and a mirror. It is understood that he slept upright in the wardrobe.

The Pacific ocean was magnificent, colonies of sea lions and sea otters providing endless delight. No-one seems to cull them, and there appear to be plenty of fish for both them and us.

To end on a serious note. Thank you Denis — you did a grand job of organising (the members as well as the tour), and contrary to predictions your subsequent nervous breakdown hasn't yet materialised.

And to our friends on the North American continent, your kindness and hospitality were beyond description. My most sincere thanks for a memorable opportunity to meet the most warm-hearted people I have ever encountered.

ANNUAL REPORTS

CHAIRMAN'S REPORT

C. John Bradfield

During my term of office no major issues or problems have arisen. Rather, it has been a year of consolidation after the hectic business of the previous year. Nevertheless a very great deal has been achieved; and the standing of the MGA in this country and throughout the world has never been higher.

As has been the custom in the past, I do not intend to go into the affairs of each sub-committee, except in one or two minor circumstances, as this is better done by each Chairman. I would, however, like to say how grateful I am to all committees for the work they have put in for the benefit of the Association.

Publicity

During the year, the Publicity Department has organised some extremely successful events. These started with the Mushroom Week, the Retailer competition, the *Woman and Home* car competition, the Catering Award, the *Woman's Own* Jumbly 79, and finally the participation with the NFU in the House of Horticulture at the Royal Show. These are all events which have done a great deal to

publicise mushrooms, and I must thank everybody who has worked so hard for their success.

Manpower and Economics

During the year, the Manpower Committee, under the guidance of its Chairman Peter Middlebrook, organised an industrial survey for the whole industry. The results which have now been analysed by the independent Schlackman Research Organisation show a response of just under 50% of the mushroom industry and will provide valuable information for this committee in the future.

Research Committee

At its meetings throughout the year, the Research Committee has continued its policy of holding meetings at the various mushroom research establishments. These meetings, combined with a dinner the previous evening when the Research Committee, the research workers, and invited growers discuss mushroom problems, go a long way to help each side to understand the problems of the other's.

Treasurer

Hugh Barton has completed his first year as our new Treasurer. I am sure he would be the first to admit it has been comparatively smooth due to the efficient budgeting system introduced by his predecessors. This is not belittling the way the Treasurer has set about his new task; the fact is that the Association's finances are on a sound footing with an efficient person at the helm.

Canadian/American Study Tour

Thirty-two members set out in April on a most successful tour of Canada and America. The tour commenced at Irving Slack's farm in Canada where the MGA party helped him celebrate his company's 75th anniversary. Eleven days later it finished in Ventura, California, a total of 11,000 miles, visits to 10 farms, fantastic hospitality and, then, drink and jet lag!

Resignation of the Journal Editor

I regret to announce the resignation of Fred. C. Atkins as Editor of *The Mushroom Journal*. Fred. has done an excellent job during the last 12 months maintaining the high standards of the *Journal* and I am sure you would wish me to thank him for all his hard work.

By the time this report is published the Association hopes to be able to announce the name of the new Editor.

Area Meetings

During the year, 16 area meetings have been organised in conjunction with ADAS. These meetings do nothing but good as they strengthen the grass roots of the MGA and familiarise the ADAS officers with the growers' problems.

I would like on your behalf to thank Richard Gaze and his colleagues for their help in organising this

record number of meetings and hope they can continue in 1980 with the same vigour.

Industrial Seminar

A one-day industrial-relations seminar was held in March at the Shuttleworth Agriculture College. The team of speakers lectured on the employment protection act, Health & Safety, and the Agricultural Training Board. These proved very stimulating for those who attended and a similar seminar is being repeated next year.

MGA Organisation

Over the past years, the Association has been very fortunate in having a staff who have served it well for a number of years. Then suddenly it changed and, in a period of 18 months, all faces were new. This is not satisfactory, as a compact, friendly industry such as ours needs a staff that knows its members and all the workings of the Association. I am pleased therefore to report that, except for one junior, there have been no staff changes in the year at the time of going to press.

Finally, I would like to thank my Vice-Chairman, Peter Cracknell, the Treasurer, Hugh Barton, the members of the Executive Committee, and the sub-committees who have supported me wholeheartedly and made my year of Chairmanship so easy.

My thanks to the staff, ably led by our Director, Denis Locke. They are the backroom boys and girls on which our organisation depends, and without their loyal efficiency our Association would be the poorer. They could not have helped me more, and I am grateful.

DIRECTOR'S REPORT

Denis N. Locke

The past year for growers has been a rather mixed one. On the cultural side we have experienced many difficulties. Apart from *Verticillium* and Blotch we have suffered a series of shortages of peat starting in October with a fire at one of the peat bogs in Ireland, followed almost immediately by our lorry drivers' strike, and then a strike at one of the peat farms in Ireland. All this added up to chaos for our industry. Despite all our efforts in lobbying not only the Ministry of Agriculture but the Government itself, the day really was won by secondary picketing of a most vicious kind — in spite of Government pleas on behalf of our industry and even by the Union officials themselves.

With regard to the fuel shortage, lobbying of the Ministry of Agriculture has been successful in that I do not know of a grower who up to the time of writing has been without fuel.

The troubles ahead are the ultimate price of fuel and what this will do to the economics of our industry and the fluctuating seasonal demand for

mushrooms which is so relative to weather conditions, time of year, etc.

On the trading front I think we can be thankful that we have experienced a year in which prices have kept pace with increased costs and, therefore, we are holding our own as an industry despite the conditions in which we have had to operate. Whether or not we will be able to continue this pattern into the coming year is a matter of conjecture. One thing is certain; we shall have to be very alive to every move in the market-place to ensure that our industry remains on an even keel.

Recent news of the merger of CKF into the Heinz/Darlington fold came as a surprise to us all. It appears to be a very responsible move by large members of our Association. Granted the desire and the ability to expand, the best possible way to do that was to 'buy in' production which already existed rather than to try and achieve similar volumes by building a new farm. In no way wishing to appear morbid, it does strike me that there are many aspects of the present market situation which are remarkably similar to those which appeared in late 1973 and early 1974, and I think it would be a brave man who forecast a bumper year for our industry. Indeed, it behoves us to keep a very wary eye on what is happening to inflation and to the disposable income which is in the housewife's purse. There is no doubt that the buoyancy of the Mushroom Market depends upon, and is so relative to, the affluence of the consumer.

Administration

The office staff have worked tremendously hard throughout the year, and have settled in extremely well, taking on a tremendous number of tasks to which they were quite unused in the past and doing them exceptionally well. Jenny Walton in particular has taken on a tremendous number of new jobs which has enhanced the coverage of service your Association offers you as Members.

Contact with Government departments has been maintained and in some areas extended particularly with regard to other EEC countries. Meetings of the COPA/COGECA Fruit and Vegetable working party have been attended in Brussels and England. We have been able to achieve a restriction on imports from Third-world countries. This has meant a better living not only for our European colleagues, but has prevented imports of low-priced fresh and canned mushrooms into the United Kingdom. This has in no small way helped to stabilise our market, particularly when we bear in mind that, with the strengthening of the pound, exports to this country become, in the eyes of the other countries, more desirable. Representations on behalf of our industry have also been made to the European Mushroom Producers Group in Paris, not only on

production but in the use of chemicals etc., and these meetings are proving more and more worthwhile as a means to influence the Commission on proposed legislation which would affect our industry.

There has also been increased communication and co-operation between ourselves and ADAS and I think the benefit of this co-operation is beginning to show in, among other things, our Area Meetings. These meetings have in the past year been held much more frequently than in the past and have been extremely well attended by both members and non-members alike. This can only bode well for our industry and the communication between all its members. Also, during the year we organised a very successful twelve-day farm study tour of Canada and the States. A great deal of worthwhile information was exchanged with our North American friends and that, in many cases, more than paid for the expense involved.

In March we held a seminar for members on Labour Relations Legislation and the Health and Safety Act. Already this is bearing fruit not only among the membership but by the fact that we have received from the Department of Health and Safety requests for advice on certain matters and the opportunity to co-operate with them in framing documents for distribution throughout our industry.

The Mushroom Journal

As many of you will have heard we regret to announce that our old friend Fred. Atkins has, mainly for health reasons, decided to give up his editing of our *Journal*. I know this came as a great wrench for Fred., since he had been looking forward to enhancing the already high standard of our *Journal*. Our regrets, Fred.; and thanks once again for all that you put into the venture.

Membership increased

The Membership of the Association as at the 30th June was:

Grower Members 183 (this shows an increase over the previous year of 18, and for the second time in two years we can record an increase in membership). Associate Members have increased from 156 to 167 and Overseas Members stand at 467 (from 58 different countries).

Below is a list of Executive and Sub-Committee Members together with meetings and attendances of the various members.

Executive: The Executive Committee met five times in all and the attendances were: C. J. Bradfield (Chairman), P. H. Cracknell (Vice-Chairman), H. J. Barton (Honorary Treasurer), P. W. Munns, M. H. F. Prince, T. W. A. Smith, C. G. Sander, D. B. Stanley-Evans, 5 each. P. W. Middlebrook, R. H. Pinkerton, S. A. F. Sampson, P. S. Barnes, 4 each. J. A. Bleazard, 3.

Marketing and Publicity: Number of Meetings 5. Attendances: P. H. Cracknell (Chairman), C. J. Bradfield (MGA Chairman), H. J. Barton (Honorary Treasurer), D. C. Miller, M. H. F. Prince, B. Barnes, Sylvia Hensby, 5 each. H. Owens, B. R. Howes, K. A. S. Jamieson, 4 each. E. T. Marriott, 3. A. E. Spencer, A. Milestone, 2 each.

Manpower and Economics Sub-Committee: Number of Meetings 5. Attendances: P. W. Middlebrook (Chairman), 4. P. Mellor, T. W. A. Smith, D. B. Stanley-Evans, C. J. Bradfield, 5 each. P. S. Barnes, C. G. Sander, H. J. Barton (Honorary Treasurer), 4 each. P. H. Cracknell (MGA Vice-Chairman), 3.

Research and Development Sub-Committee: Number of meetings 3. Attendances: P. J. Middlebrook (Chairman), H. J. Barton (MGA Honorary Treasurer), G. W. Ganney, R. H. Pinkerton, F. Stewart-Wood, 3 each. R. C. Jones, N. Barnard, C. J. Bradfield (MGA Chairman), 2 each.

Education and Training Sub-Committee: Number of meetings 1. Attendances: R. L. Edwards (Chairman), J. H. Green, D. Humphries, C. L. Todd, E. Dougal, R. H. Gaze, H. J. Barton, L. Jacobs, C. J. Bradfield (MGA Chairman), 1 each.

TREASURER'S REPORT

H. J. Barton

In this, my first year as Treasurer, I have examined the MGA accounts and the systems operated and have met all those persons involved in the finances of the MGA, namely Spencer Fellows & Co., the independent accountants who collect the Spawn Contribution; Kevin Jamieson, Secretary of the Spawn Federation; and MGA auditors Roffe Sayne & Co.

I have found a great desire by everyone to help the MGA to establish a sound financial basis and I think the following comments on the accounts will show that this is being achieved.

General Account

This shows a small surplus on the year of £593 and in my view this is as it should be, as it is understandably a relative easy account to budget for income and expenditure.

Publicity and Marketing Account

This again shows a surplus of £9,134 and in my view this is an acceptable difference as it is difficult to forecast income and, because of this, to budget expenditure. The accounts in general are in a very satisfactory state and this is in no small measure due to the hard work and efforts of Committee Members over a number of years, particularly those who took on the MGA accounts through the crisis years of 1973/74. Inflation will undoubtedly continue, but both subscriptions and spawn contributions have been indexed accordingly. This should

enable us to overcome the difficulties ahead, providing the industry remains buoyant and avoids the danger of a Mushroom Mountain.

RESEARCH AND DEVELOPMENT

Paul J. Middlebrook

During the past year the R & D Committee has visited the Lee Valley EHS at Hoddesdon and again invited growers for an informal discussion in the evening on research topics. At Hoddesdon we were disappointed to find there had been some staff changes and the mushroom unit was not being run by an experienced grower. The constant changes in staff that occur in ADAS due to their promotional system was not in the opinion of the committee helpful to development work. It was felt that time spent training personnel to understand how to grow mushrooms could be spent on development work. The committee would like to see this situation rectified but at present cannot see this happening. We would nevertheless like to thank George Allen and his staff for the work they do on mushrooms, even with such difficulties.

During the past year the Chairman and Vice-Chairman visited NIAE at Silsoe where they were shown the research facilities available and the work under review. It was felt that there were areas such as environmental controls and ice-bank cooling where such research could have direct application to mushrooms and could be usefully adapted to this crop. Hopefully during the next year we will be able to encourage NIAE to become interested enough to do some work for the mushroom industry.

Unfortunately, due to the severe winter the visit to GCRI did not take place but the committee will have visited there by the time of the Conference.

I would like to thank the committee for their continued support and also the ARC, ADAS, and the Universities for the work they are continuing to carry out on our behalf.

THE MUSHROOM JOURNAL

Fred. C. Atkins

Having spent exactly 50 years training (unwittingly, mind you) for the editorship of *The Mushroom Journal*, it distresses me that within 15 months I must abandon ship. For once my timing of events was adrift; I left it too late.

During my brief term of office I have done all I could to widen the scope and international interest of our publication. This has entailed an increase in the number of pages and pictures; yet I have not exceeded the budget set for me, largely because for health reasons I have not travelled far or often — a fact which has led to some adverse comment. My view is that an editor should 'edit' and persuade others to 'report'. Critics disagree, failing to realise

there is not enough time to do both. Two days a week are barely adequate for the editing and letter-writing.

As a professional journalist I have been unhappy about the handling of our advertising. I hope my successor will accept this added responsibility. It would be a much tidier arrangement.

The *Journal* must be almost the sole reason for our considerable world-wide membership, as many letters I receive testify. And I must thank my personal 'Think Tank' — Raymond Thompson, Derek Rudd-Jones and Stan Maney — and my colleagues on the Editorial Board: Ron Edwards, who assiduously reads and corrects proofs, Peter Middlebrook, Geoff Ganney, Peter Munns and my old sparring partner Winston Alderton. They have watched me closely; in the main, their criticisms have been constructive, and I am grateful.

EDUCATION AND TRAINING

Ronald L. Edwards

The Committee has unfortunately not met during the past year. A meeting was arranged for January at the University of Aston, but owing to severe travelling difficulties no formal meeting was held. Attempts to arrange another date there have been unsuccessful, but a meeting was arranged for July.

The mushroom teaching unit at the West Sussex School of Agriculture is now in operation, and one crop has been grown. Its use for teaching was due to start this month.

MARKETING AND PUBLICITY

Peter H. Cracknell

With other branches of horticulture now beginning to realize the importance of publicising their product and in certain quarters raising funds for this purpose, I believe the need to keep mushrooms in front of the consumers eye is as important now as it has ever been in the past. So with this in mind your committee has pursued a policy once again of concentrating most of its efforts and resources at the retailer and consumer end of the market. However, we are looking for a greater involvement with the wholesale trade and are continuing our work with the Catering Industry.

Looking back at last autumn's successful mushroom week we had 47,500 entries in the *Woman and Home* competition and the winner was presented with her prize of a Vauxhall car by our Chairman, John Bradfield, on 11th April. The retailers' shop window display finalists were entertained to a breakfast and prize-giving at Covent Garden in January. All the finalists reported increased sales due to the display, even as much as a 300% increase and they reported that their mushroom sales had remained at a higher level after the campaign than before. However, the number of entrants to this

competition was a little disappointing, so this year we are aiming to increase our coverage of the Retail Trade and hopefully increase the response.

The Silver Mushroom Catering Award competition finals were held at the Carlton Tower Hotel on 29th March. Six finalists participated and produced some superb mushroom dishes. The judges, press and competitors were entertained to an excellent lunch afterwards, and I believe this event was an impressive first step into the catering world.

This year's Spring Campaign has been centred on two ladies' organizations — the Women's Institute and the National Union of Townswomen's Guilds. Competitions are being organised for groups and individuals and it is planned to hold the finals during our National Mushroom Week, which this year will be from 5th–10th November.

The Mushroom Week campaign will be similar to last year with a consumers competition held in conjunction with *Woman's Own*. This magazine has a circulation of 1.5 million and will give us double the coverage of last year's campaign. The competition will be in the edition released during Mushroom Week.

The Window Display Competition this year has been directed mainly at the members of the Retail Fruit Trades Federation, of whom there are several thousand. Combined with this we are holding a Slogan Competition, and already slogans and requests for material are coming in. It is also hoped that during this week Growers would be prepared to hold a Farm Walk for, say, 20 people, composed of possibly local press, associations or even their own customers. After all, with inflation galloping ahead once more the price increases that will be required by Growers may well necessitate a little goodwill!

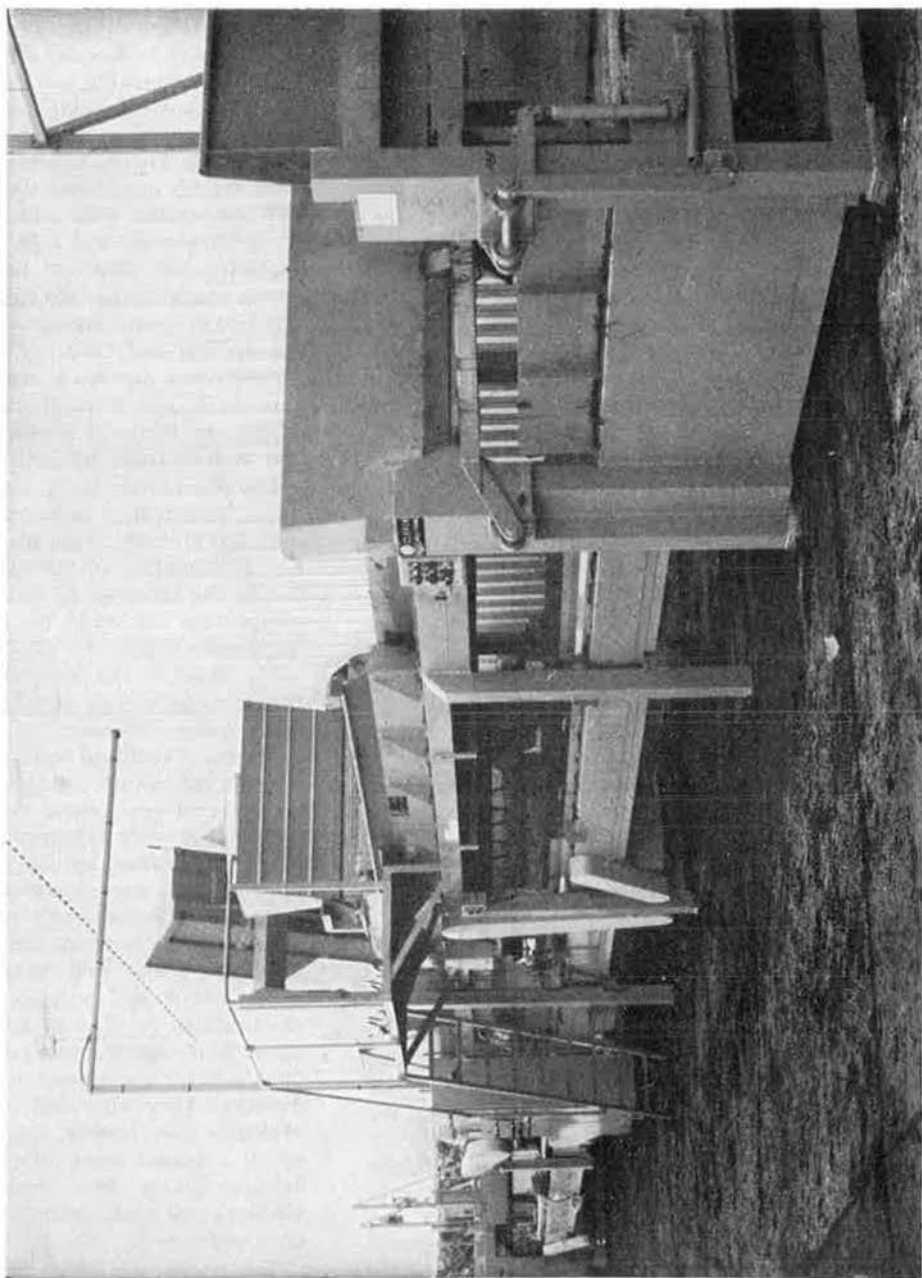
The MGA had a stand in the new House of Horticulture Pavilion at the Royal Show in July where Mary and Patricia provided samples of deep fried battered mushrooms as well as selling the fresh product. They also had a Mushroom stand at *Woman's Own* Jumbly, again at Alexandra Palace, which attracted many thousands of people. Agricultural Shows have been covered by various Growers and once again thousands of leaflets have been distributed.

The paper-bags which proved so successful last year have been repeated and it is hoped that our wholesaler friends will give us some assistance in their distribution. By ordering 5 million we have obtained a very competitive price which makes this particular venture almost self-financing. During Mushroom Week we hope to hold receptions for the trade at four major centres up and down the country.

The lecture kit containing colour slides, which was discussed at last year's Conference, is nearing completion and it will be shown at the Yarmouth



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Conference. We also hope to present the document on grading, the details of which have finally been agreed by the committee.

We have recently agreed with Tribute Film Productions to them making a five-minute Newsreel-type film on the Mushroom Industry. The film will be a documentary specially designed for transmission by Thames Television in the autumn. The series of films so far include such industries as Banking, Timber, Paint, etc., and is designed to interest 'Young Britain' visually in the various aspects of production and behind-the-scenes activities in Companies, and to give young people an insight into job opportunities within the Industries that have been filmed. After its showing on TV it will be available to schools which could assist with recruiting young people into the Mushroom Industry.

Our ongoing activities in the field of Public Relations with the National and Regional Press, Home Economists and Women's Magazines and organisations throughout the country, has been maintained. The new style Point-of-Sale Material has proved very popular and large quantities have been distributed during the past year. Mushroom Balloons are taking over from last year's Mushroom Badges and a newly designed Tea-Towel will soon be available.

At the time of this Report going to press we have lost the services of Mary Adams. Patricia Morrison, who has worked extremely hard for us during the past year, is holding the fort.

I would also like to thank all the members of the Publicity Committee for their time and support.

MANPOWER AND ECONOMICS

Peter W. Middlebrook

Since the last AGM the Committee has met on four occasions. Two questionnaires have been sent out; a simplified version to all grower members, and an up-dating of last year's more comprehensive questionnaire to twenty selected members representing a cross section of the industry. The response in both cases has been most encouraging and before the Conference all respondents should have received a summary of the results, with explanatory notes. The general work of our committee is done in conjunction with the Director and is covered in his Report, but I wish to comment in particular on three main issues.

1. Annual Wages Negotiations: Again the workers will be submitting a claim out of all proportion with the industry's ability to pay, and the committee will be preparing an answer on behalf of the mushroom growers which will be incorporated into the reply made by the Employers representatives on the Wages Board. In general, employers in our sector of the

industry pay wages far higher than the minimum laid down by the AWB, but the extent to which these differentials can be maintained will depend on how the Board's settlement relates to increases awarded in other industries. Members are advised to be wary of negotiating in terms of percentages during the current wages round: the cash award by the AWB will be of greater significance to those employers who are already paying well over the minimum rates.

2. Shortages of Peat and Fuel Oil: The committee has made direct representations to the Irish Peat Authority to clarify the position regarding supplies of peat to the UK mushroom industry. We have been given certain assurances that mushroom growers have priority along with other commercial users of peat, but the situation remains unsatisfactory and the committee would stress the need for the industry to encourage more research into finding an alternative casing material. The fuel-oil situation is likely to become more critical as winter approaches, and the Association, through the NFU, is pressing the Ministry for some assurance that supplies to mushroom farms will be maintained on a priority basis along with other food production units. The committee will continue to monitor the situation very closely.

3. The Economy of Supply and Demand: The overall production appears to be at a higher level than during the previous two years, and there are now definite signs that supplies of mushrooms on to the wholesale markets are likely to increase substantially during 1979/80. Some of the smaller and medium-sized growers are expanding their farms, and we understand that there are plans to expand the mushroom industry in Ireland. Already during the summer months we have experienced the effects of over supply, and the committee warns that unless there is some corresponding growth in the market this situation will become serious and lead to another recession in our industry.

Finally, I would wish to thank Denis Locke and his staff for the tremendous support they have given to my committee.



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SORRY, LITTLE FRED!

The last paragraph in the Hayes History on page 327 of July *Journal* 79 originally read: 'Intensely interested in Association Football, Cricket and Rugby Union, but no longer active! Sings tenor in one of the most active and successful Welsh Male Voice Choirs, The Canoldir'.

Disliking two 'actives' in two lines, I had intended to remove the second (... active and ...); unfortunately I did not see a corrected proof, which indicated he was no longer 'intensely interested' in those games, and I hope he — and you — will accept my regrets at the error.

The Editor

ISMS ELECTIONS

Dr. Klaus Grabbe, hon. secretary and treasurer of the International Society for Mushroom Science, announces the election of the following to the Council: M. Lawson, Australia; K. Bech, Denmark; drs. P. J. Bels, Netherlands; C. MacCanna, Eire; Dr. J. Delmas, France; E. Piorkowski, Poland; C. I. Slack, Canada; Dr. K. Grabbe, Germany; L. Stockert, Austria; J. Roca Dumora, Spain; Dr. K. Ono, Japan; J. Kuhn, Switzerland; Dr. M. S. Ho, Taiwan; Dr. W. A. Hayes, Great Britain; and P. Arrau, Chile.

Honorary members of ISMS are F. C. Atkins, patron; drs. P. J. Bels, Dr. R. L. Edwards and Dr. L. R. Kneebone.

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