Lacey Green Windmill Restoration Committee
Website: **www.laceygreenwindmill.org.uk**
Email: **contact@laceygreenwindmill.org.uk**
Chiltern Society Website: **www.chilternsociety.org.uk**

Chiltern Society
We care for the Chilterns

Full text of speeches made at the presentation of Engineering Heritage Award (No 86) by the Institution of Mechanical Engineers to Lacey Green Windmill on Sunday 14th July 2013

Compiled by Michael Hardy

From 10.45, invited guests had coffee or tea in 'The Whip'.

11.30 - Michael Hardy, Honorary Secretary of Lacey Green Windmill Restoration Committee

Good morning, on behalf of the Windmill Restoration Committee, and The Chiltern Society, of which we are part, I would like to welcome everybody to Lacey Green Windmill, and thank you all for coming. My name is Michael Hardy, I have been Honorary Secretary of the Restoration Committee for 29 years. One of my duties is organising the opening of the windmill to visitors, who range from those who have never been in a mill, to those who spend their lives travelling around the world looking at wind and water mills.

For those of you who are not local, we are on the top of the escarpment of the Chiltern Hills, although the views from here down to the Vale of Aylesbury are now rather hidden behind trees and hedges. On a very clear day, from the upper floors of the windmill, it is possible to see the Cotswolds 40 miles away.

Some of you might think the windmill looks rather frivolous with its bunting. However, like yachts and ships, the dressing of a windmill with bunting is very traditional for celebrations and important occasions. And today is, of course, a very important occasion for this windmill.

I would like to tell you about some of the people who are here this morning:

- We have various people from the Chiltern Society, and some of our volunteers who work on the windmill, or help us open it to visitors.
- We have representatives from all three tiers of local government, including Cathryn Davies, Chairman of our Parish Council. Mel Foster is our Wycombe District Councillor, and Carl Etholen is our local County Councillor, and now the chairman of Buckinghamshire County Council. I know that Carl is very keen on the role of volunteers, setting many examples himself, some of which are very local. This windmill would not now exist without the efforts of volunteers.
- We have Rosemarie Smith, owner of the windmill, from whom the Chiltern Society lease the windmill. Also her son Nick and his wife Catherine. Nick has been working very hard in the last week cutting the hay crop from these fields.
- Two people are here from the world of mills, and believe me, there is a strong community of those interested, or even infatuated with mills. Mildred Cookson is a past Chairman of the Mills Section of SPAB, the Society for the Protection of Ancient Buildings. Her interest in mills was encouraged by realising how this windmill could be saved. She now edits the SPAB Mills Section Newsletter called 'Mill News'. Her husband Ron is Chairman of the Mills Archive Trust, which in 10 years has established itself as an important repository for information and images of mills. He has brought some information about the Trust today, which is on the table here.
- Steve Rodrick is here, he is the Chief Officer of the Chilterns Conservation Board. The Board's Chairman, Mike Fox, a member of IMechE is one of many people who are sorry that they cannot be with us today.

However, I would particularly like to welcome John Wood, Richard Campbell, and around 47 members of the Institution of Mechanical Engineers. We are delighted that today they are recognising the importance of this windmill, which dozens of people have worked so hard to preserve over the last 42 years.

Chiltern Society
We care for the Chilterns

So, this windmill is the country's oldest surviving smock mill, with its internal wooden machinery dating from around 1650.

Because of the way smock mills are constructed, with the main supporting or cant posts being on the vulnerable sloping corners, they did not tend to be long-lived. This one had substantial repairs in the early 19C, with its cant posts being replaced by pitch pine. However the massive timber machinery was kept, namely the windshaft, brake wheel, wallower, main shaft, and great spur wheel. Much of the timber structure, particularly on the lower floors, is also of a great age.

Considering the engineering aspects of the windmill, one can only wonder at how it was originally built around the time of the Civil War. For example, the poll end of the oak wind-shaft in the cap is over 2½ feet in diameter. The whole shaft weighs about a ton and a half, but it was raised 35 feet above the ground to be installed.

The mill has many clearly visible examples of how improving technology was used to update the mill at different times, to make use of inventions from the late 18C onwards. These include the fitting of patent sails, of which we have a display of some remaining parts.

There is still evidence of three different vintages of technology used to turn the cap, to keep the main sails facing the wind. The final method was automation using the fantail on the back of the cap. Working again since 1985, it turns 9½ tons around whenever the wind changes direction. This is the safest way to leave a windmill, particularly one in this exposed position, as the tips of our sails reach 800 feet above sea level.

Other 19th century refinements are machines for cleaning the grain, and sifting the flour. They use the largest piece of metalwork in the windmill, a drive wheel made in two halves to be bolted around the timber main shaft, which had already seen 170 years service. A governor was also fitted for minor adjustments of the speed of the mill.

The mill was working until 1915, and was used as a weekend cottage in the 1920s being patched up to try and keep it watertight. By the 1930s, easier travel in the countryside meant that redundant mills were attracting enthusiasts who studied them. Thanks to their researches, the age of this windmill's wooden machinery was recognised. So when the mill was in a sad state in 1934, the SPAB and some local people made repairs to keep it standing.

However by the end of the 1960s the mill was in a very derelict state. With some cant posts failing it was twisted and leaning away from the prevailing wind. Most experts said it was close to collapsing, and its machinery should be removed to a museum. However, a Civil Engineer, then in his mid 30s, persuaded people that he could winch it straight and then restore the whole structure. He made a model to prove precisely which cant posts needed to be pulled around from which direction to straighten the smock. That model is in the small gazebo, on your left, together with a drawing of each wall and a diagram of the straightening process. In the corner of the drawing you will see it was drawn by C Wallis in 1971.

Christopher Wallis was the man who then led the whole restoration project. His experiences with this mill led him to a new career working with historic buildings, particularly wind and water mills. Everybody who knew him would agree that he was a very determined man, undoubtedly taking after his father, Sir Barnes Neville Wallis. In 2006 Christopher died at the age of 70, you can read my obituary to him on this windmill's web site. Many photos of the restoration work include Christopher's widow Barbara, and their son and daughter, Humphrey and Amy. I am pleased to say that all 3 of them are here today, you will hear from Barbara later on. Humphrey has certainly inherited engineering skills, and this year has also been involved in some of the commemoration events for the Dam Busters Raids, made possible by his grandfather's bouncing bombs.

It is clear to see the evidence of what Christopher and a vast team of volunteers achieved. One of a few people still involved from those early days, is Mike Highfield, who was responsible for many of the more mechanical engineering parts of the restoration. You will also hear from Mike later on.

Chiltern Society
We care for the Chilterns

I should also explain that since the restoration, we have ground a small amount of flour on a couple of occasions. However, we have now decided that to put the 360 year old machinery under load again would be putting it too much at risk, so you will see the wallower is now disengaged from the Brake Wheel. We do occasionally let the sails turn, usually just on the Sunday of National Mills Weekend, but that has to be done with extreme caution, as the sails are effectively freewheeling, without any means of stopping them if the wind became too strong.

Also in the small gazebo today, is a detailed display about the history of the windmill, and some details about the restoration. In the large white tent, are a series of photos showing how the windmill has looked at various times since 1900. There is also a small selection of the many old press cuttings that I keep about the mill.

In the basement of the mill is a display on its history and restoration, with others about particular aspects, including a map showing the importance of mills in the 19th century. In contrast, there is a comparison of the tiny amount of power that this windmill would produce compared to a modern wind turbine. All the displays are my work, so feel free to direct any comments to me, good or bad. We try to keep the top three floors of the mill as they would have been when it was working.

Behind the windmill is a small 19th century granary, and to the left of that is a toilet. On this hot day, I have brought some water for anybody who needs it. It is outside, but in the shade of the windmill.

Next there will be an open session of the windmill for IMechE members only, as the numbers attending are the maximum number that we can allow inside at any one time. It is impractical to give guided tours for you all, but there will be somebody on each floor to help you. I would just like to tell you who I have chosen to be in the mill for you.

On the top or Dust Floor will be David Lawrence, himself a member of IMechE. His background was in the RAF, and before retiring he was a Senior Curator at the RAF Museum Hendon.

On the Bin Floor will be Alison Farlie, who has a great interest in Vernacular and Industrial Buildings. She and her husband are regular guides at the Chiltern Open Air Museum, which houses an increasing collection of preserved buildings.

On the Stone Floor will be Ronnie Lewin, a scientist himself, who I believe could actually tell you something about “Rocket Science”. His passion now is to increase children’s interest and involvement with scientific matters, cunningly done in his own entertaining style.

My wife Betty will be in the basement or Meal Floor, together with Ronnie’s wife Liz with our very small retail department. Please collect a copy of our Guide Book from them on your way out, courtesy of IMechE.

Outside will be Al Dutton, somebody who brings wind power engineering up to date, as his work involves Off-Shore Wind Farms.

So, although our people are all volunteers, I think they have an admirable range of skills and interests.

You will need to go up three ladders to get to the top floor. They are substantial, but do show their age. When coming down, please descend backwards. If anybody cannot get up the ladders, in the basement there is a book of photos of each floor, and copies of most of my displays. Please ask Betty or Liz in the basement.

I would now like to invite the members of the IMechE to look around the interior of Lacey Green Windmill. You can use the steps down to the Meal Floor, or those which go up to the Stone Floor. Please be back here by 12.20.

The members of iMechE then visited the interior of the windmill.

Michael Hardy then introduced John Wood.

12.20 - John Wood, Chairman of Heritage Committee of Institution of Mechanical Engineers

Michael, thank you very much indeed, and thank you for such an excellent introduction and such an interesting talk earlier on. In fact, one of the problems of following somebody like Michael is that he has covered all the important bits and probably done it much more eloquently and in much more detail than I could possibly do, but bear in mind that I will try and avoid going over things that he has already covered so well. But first of all, can I say welcome to all the members of the Institution and to thank all members of the Chiltern Society who have invited us here today and put on such an excellent event, and thank you very much indeed for all the preparation and for showing us around this wonderful mill.

So really, my task is to welcome everybody to Lacey Green, and to do the presentation of what is our 86th Engineering Heritage Award. For those who do not know, the Institution's Engineering Heritage Scheme is now in its 29th year, but really it was rejuvenated a few years ago by our immediate past President, Lady Isobel Pollock, and she set a target of achieving 100 awards by the middle of next year. I have to say that we are well on the way to that, and in fact, we have got at least 100 applications in the pipeline, so that is very good news. I think that also reflects the growing interest in industrial heritage. We have a very rich engineering and industrial heritage in this country, and a recent survey by English Heritage said that the public awareness of the value of this has raised significantly, and the majority of people, when asked, say that they do regard the engineering and industrial heritage in this country to be as least as important as the traditional heritage of great houses and castles. But, it is something that is very much at risk, and unless we work to preserve and encourage people in the preservation of that, we could so easily lose that, and there are many, I am afraid, tragic stories of very important artefacts, or sites that have disappeared. At the same time, there are, of course, success stories, and I think everybody is aware from what we have heard today that Lacey Green is very much one of those success stories.

Past Heritage Award recipients include artefacts as varied as the E-Type Jaguar, HMS Belfast, Tower Bridge, Sir Nigel Gresley's Mallard locomotive, but Lacey Green is the first windmill to be recognized by the award, and it is going to be one of the very earliest recipients, dating back as it does to the 17th century. Why do we do these awards, well obviously it is to preserve and raise awareness of the heritage that we have in this country, but I think it is also to inspire the younger generation.

I was very much taken to Michael's reference to people who are interested and indeed infatuated with mills and I would immediately put myself into that category. I grew up in Sussex, very close to the Smock Mill at Shipley. Indeed, I can remember going round that as a very young lad, and seeing that machinery was certainly was something that was formative in my interest in these sorts of things. Later I was at school in Cranbrook in Kent, and indeed my bedroom window looked across the road to the grand Union Mill, the tallest Smock mill in the country. So windmills are very much something I think which I have a great affinity for, and indeed my wife will tell you that I dragged her round a load of Drainage Mills on Wednesday this week, but that is another story.

Let us think about the period when this mill was built. As Michael rightly said, we are talking about the period of the English Civil War. Grinding corn was a labour intensive business, it required power to do it in any sort of bulk, and it is little surprise really, that it was one of the earliest areas to be addressed by the emerging technologies of the time. The other probably was the passage of time, with clocks. If you look back to that period, there are really only two examples of technology that we would call mechanical engineering. One is milling, and the other is clockwork.

As Michael again said, mills, of course, over the years became increasingly sophisticated, and we have seen some wonderful examples of that in this mill, the governer, the fan tail, and so on. By the end of their

development, windmills were extremely sophisticated, elegant, efficient pieces of equipment for their time. But when they were built they were very much the cutting edge of technology. An early windmill in the 17th century, must have seemed, to the people around about, to be something almost magical, and the people involved in building it and running it again had special knowledge. The term millwright comes from that era, and yet the trade millwright still exists today, and is a respected trade in the business of plant and maintenance engineering.

Over time, of course, mills have evolved and been developed, again as Michael rightly said, and I think you have got to trace those origins back to the early mills. Mills generally have survived quite well, they are such a part of the landscape that there has been an awareness of them, and tower mills, in particular, are quite plentiful. But it is the earlier mills, the wooden mills, the post mills and the smock mills from that early age that have not survived so well, because of the ravages of time, rot, fire and all the other things that have led to their demise.

This mill could so easily have been lost, as we have all seen from the photographs, and again from Michael's talk, that not so very long ago, this mill was in danger of complete collapse. The experts said the best thing was to let it fall down or at least to remove the wooden machinery to a museum, and then let it collapse. Luckily, of course, there were a group of enthusiastic people coming together to save this mill, with dedication and enthusiasm. Over this period of approaching 50 years, it has been restored from a shell, to something which now is a wonderful example of how it would have looked in its prime. However, even the very best group of enthusiasts need somebody of a special sort of person to lead it, somebody who is not prepared to accept the expert's view that it is going to collapse, will not take no for an answer, and does not understand terms like 'it is impossible to save it'. Of course that person, as we have heard, was Christopher Wallis. His determination, his passion, his engineering ability, were instrumental in saving this marvellous mill, to ensure that we can now enjoy it today, and hopefully it will survive for many generations to enjoy in the years ahead.

So it is with great pleasure that I can welcome Lacey Green Windmill as the 86th member of the Engineering Heritage family, and it is going to be a huge pleasure for me to be able to present the plaque to Barbara Wallis, on behalf of the Restoration Committee, with the following citation, that is on the plaque:

Lacey Green Windmill

The oldest surviving Smock Windmill in the United Kingdom with wooden machinery dating from around 1650. Restored from dereliction to working order between 1971 and 1986 by volunteer members of The Chiltern Society.

John Wood then presented Barbara Wallis with the EHA plaque.

12.30 - Barbara Wallis, Widow of Christopher Wallis (Engineer in charge of Restoration 1971-2006)

Thank you very much. It is with great pleasure that I accept this on behalf of The Chiltern Society. My husband Christopher Wallis found the engineering solution to the problem that was Lacey Green Windmill. For several years The Chiltern Society had wanted to repair it, but could not see how, until Christopher applied the engineering solution that was needed. It gives me great pleasure that this award has been given to us by an Engineering Institution. Of course, I might have liked it to have been the Institution of Civil Engineers *(of which Christopher was a member)* but surely the Mechanical Engineers are not just the next best thing, but just as good. Thank you.

Michael Hardy then introduced Mike Highfield, saying that he had been involved with the initial discussions about the windmill, and had now worked on the windmill for 42 years since the restoration started in 1971.

Mike Highfield, Chairman of Lacey Green Windmill Restoration Committee

Thank you for that introduction. I will be brief, I don't want anyone succumbing to heat exhaustion.

I am delighted that we have received an award from such an organisation as the Institution of Mechanical Engineers whose members represent the cream of their profession, the Institution setting the highest standards. They do not make awards lightly.

The award is a tribute to the original builders, men who never presented a paper to a learned society and may not have been able to write one had they been invited. They were great engineers who had solved the problems of gear ratios, mesh and pitch circles long before maths arrived to prove them right. We will never discover their names and it is a great honour for us to stand proxy for their expertise.

In the restoration we have just followed the work that was already there, Chris Wallis's question was always *"how would they have done it ?"*

Regarding our volunteers who have worked on the mill, a good many of them have now gone ahead to meet the orginal builders, who have no doubt told them where they have gone wrong. Volunteering is not easy, as has already been said, good intentions will get you nowhere. The group must have a good leader able to be firm but diplomatic, a good working plan and above all stickability. The task looked impossible but they did not regard this as a problem but it would take a considerable time. It did!

For their recognition of an outstanding machine, I must once again thank the Institution.

Michael Hardy then introduced Roger Newman.

Roger Newman, Vice-Chairman of The Chiltern Society

Thank you to everybody for joining us today. I would like to start by formally congratulating Michael and Betty Hardy for laying on such a fantastic day, with all their volunteers. Michael has been working really hard at this for weeks now. Those of us who have been involved with these types of event know how much hard work goes into it, and what goes on behind the scenes to make it all run smoothly. It is a credit to Michael and all the team involved for today.

Our Society's President, Michael Rush, sent his apologies as he could not be here today, but I think his observations are worth repeating because they certainly reflect the views of the Executive Council of The Chiltern Society very eloquently. Michael Rush sent the following to Michael Hardy: *"I was absolutely delighted to hear about this wonderful achievement by you and all your committee and volunteers, and especially remembering the inspirational leadership of Chris Wallis, in gaining the award for Lacey Green Windmill. This very prestigious award by the Institution of Mechanical Engineers is a well earned recognition for all the hard work and efforts over the past decades. I am sure that everyone closely involved will take very great pride in the award, which also reflects so well on The Chiltern Society as a whole."* That is from our President.

I think the other thing I would just like to add, trying to make sure we do not all expire in a few minutes, is that this represents an important milestone for The Chiltern Society, which was founded nearly 50 years ago. For those of you who may not know, it is a membership organization with 6,500 members and over 400 very

active volunteers. In addition to looking after some of our built heritage, as we have seen today, it is very actively involved in maintaining pathways, looking after hill-forts, working on local nature reserves, installing gates to make access to the countryside more acceptable and easier. It also has cycling groups, walking groups, a photographic group, and is very actively involved in looking after all aspects of life and the heritage here in the Chilterns. The issue of recognition is quite an important one, because in just a week or so, we will also be celebrating the taking over of three sites from Wycombe District Council, as part of their natural heritage. Later in the year, we will be looking forward to taking over another six sites from Buckinghamshire County Council, which again is a reflection of the recognition that the Society has, and its contribution to the life and heritage of the Chilterns.

Looking forward, I think that one of the things we need to do is to think about the next generation, learning and involving young people in some of our activities, but engaging with new communities across the Chilterns, and that certainly is going to be a big challenge for us going forward from here. But I think that seeing what has been done here, what has been achieved at Lacey Green windmill, cannot but provide tremendous inspiration for new volunteers, both in terms of the dedication and commitment and long-standing tenacity to overcome all sorts of obstacles to achieve a realistic goal. So again, we are at a really important milestone for the Chiltern Society, and I would just like to end by thanking the Lacey Green Windmill team again, for all their hard work over the years, wish them well for the future, and to thank John Wood and all the members of the Institution of Mechanical Engineers for joining us today, and hope you enjoy the rest of your day. Thank you very much.

Michael Hardy, Honorary Secretary of Lacey Green Windmill Restoration Committee

Thank you very much to John, Barbara, Mike and Roger. In a minute it will be time for our detailed tour of the windmill, for the people who have tickets. It will be conducted by Chris Boll, one of our Committee Members, and himself a member of IMechE. However, crucially for those attending, you will benefit from Chris's life-long interest and expertise in mills. However, I have to ask you to let him go by 1.30 as that is when I have a table booked for lunch at The Whip for some of our committee. But, I should add, as far as I am aware, it is the first time in 42 years we have stopped work for such an indulgence.

This afternoon the windmill will be open to visitors as usual, but from 1.30 through to 5.00.

Finally, I would like to thank the many people who have helped me set everything up for today. They are too numerous to list, but we do have to give special thanks to Rosemarie Smith for letting us use this field, before her cows reclaim it as their territory for the rest of the year. On this fine summer day, I hope all of you have noticed that here on one of the highest villages along the Chilterns escarpment, we have managed to keep a gentle breeze all morning. In fact while you have all been here, that breeze has moved from the north to the north-west, giving you a perfect demonstration of how the windmill always adjusts her cap to keep the main sails facing into the wind.

12.45 to 1.30 - 12 people then had a guided tour of the windmill with Chris Boll.