

# LIONSHEART

Number 45

July 1998



## LIONSMEET '98

Presented by the Old Locomotive Committee  
Hosted by Stockport & District SME

### Saturday 15th August



Owners of models of LION and other prototypes up to 1851 are invited to the annual OLCO rally, held this year at the Stockport & District SME track in Stanley Road, Cheadle Hulme. Raised 2 1/2", 3 1/2" & 5" and ground level 7 1/4" tracks. Boiler Certificates required to run. Come and display, watch or just meet. Find out more about Lion and OLCO Further information - John Hawley - tel: 01275 472023

### The Editor's Bit.

Once again, I welcome you to the Occasional Newsletter, with details of Lionsmeet at Stockport, contributions from readers, letters and much more. The panel above says it all. Less than four weeks to go. I hope you can come and watch or compete and make it an event to remember. If you have a non-competitive Lion, bring it along as a display item. If you haven't a Lion, come anyway, enjoy the event, meet the people and determine to join in next time. By the way, we welcome as static or working models those whose prototypes were built before 1851, the year of the Great Exhibition, though they may not partake in the actual competition. Members who have witnessed this event in the past, or who bought the Lionsmeet '96 video will be well aware how friendly an event it is. There are also two cups to win, one each for 5" and 7 1/4" gauges. There has never been a separate trophy for the 3 1/2" Lions, so I will follow the precedent I set last year and present to each competitor in this size a bottle of wine. (After the event of course!). More details inside.

The AGM went well with no changes to the serving officers whom I list below:-

- Chairman - E F Clark Joint founder member of OLCO and great great grandson of James Kitson, of Todd, Kitson and Laird, Leeds, builders of Lion in 1838.
- Treasurer - Jon Swindlehurst Winner of 1995 LBSC Memorial Bowl and First Prize and of Lionsmeet 1997 in 5" gauge at Peterborough.
- Secretary - John Hawley Lionsheart Editor, about whom the less said the better.

I must apologise for the obvious joins in this issue of the newsletter. Events have conspired to delay me somewhat, so I have taken some contributions and simply photocopied them to save on typing time. My thanks to those who have contributed and in response to queries, I can accept data on 3 1/4" floppy discs in Microsoft Works 4.0 format or on paper. Font is Times New Roman 12pt(Except this page, which is 11pt, due to space restrictions). Margins are:- Left 2.5cm; Right - 1.3cm. There, that's the technical bit over.

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We will be the guests of the Stockport and District Society of Model Engineers, to whom we extend our thanks for hosting the event.

A map of how to get there, track details and all supporting information is laid out below. An accommodation list is included with this issue. The track should be open by 10.00 and practice is allowed from that time until as close as you wish to get to lunch, which is fairly flexible, but the actual competition will start no later than 2.00pm, to allow us to run all competitors, finish, collate results and do the presentations in time to vacate the premises completely by 5.00pm - Closing Time. As you arrive, please make yourself known to any member of the host club who may be present. They will then advise you where to get coal and water, blower connections, etc. and generally make you feel at home. You may need to show your boiler certificate at this point and certainly for the competition.

The Track (From Norman Pendlebury - Hon. Sec., Stockport & District Society of Model Engineers)

We do not have a track plan available at the moment. Our raised track is approximately 1,000' in length, laid with aluminium rail, 5", 3.5" and 2.5" gauge. Minimum radius of curves is approximately 40' and ruling gradient is about 1 in 100. The ground level track is steel, laid to 7.25" gauge only and shorter than the raised track. A passing loop exists at the "Station", allowing trains to stop without interrupting continuous running. The raised track has automatic signalling in the "Station Area" to protect trains loading and unloading; the ground level track is not, at present, signalled.

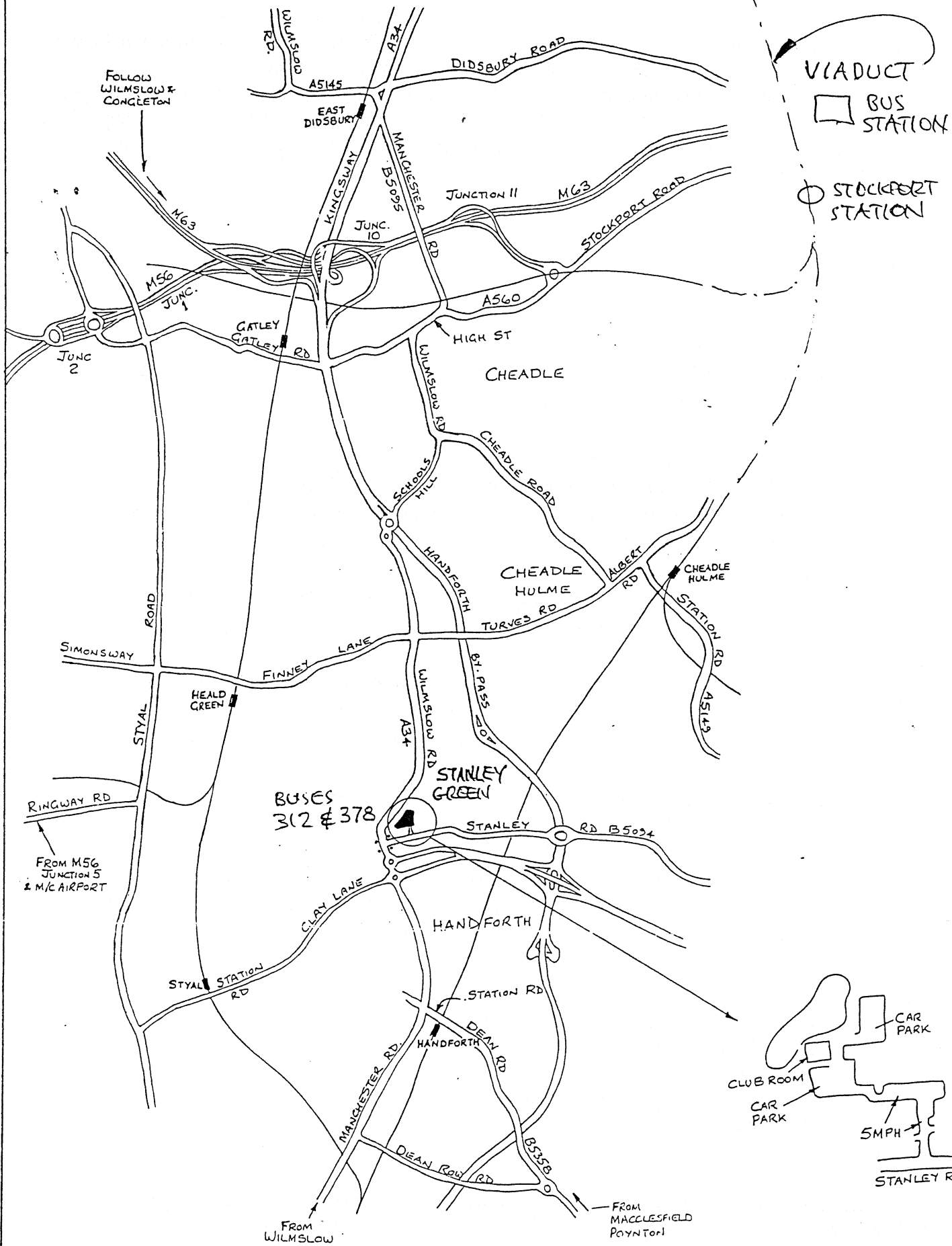
Unloading facilities are provided to allow easy transfer of locomotive of all gauges to the steaming bays, which are equipped with 12V and 24V. dc. electrical supplies, water hoses and compressed air lines. Trackside water points are available on both tracks.

Rolling stock for both 5" and 7.25" gauge track is available. We are currently rebuilding the 5" gauge passenger cars and the "loading gauge" drawings are at present being revised. However, the ground level and anti-tip rail clearances on the raised track are generous and should not give rise to any difficulty. I would expect that we have sufficient rolling stock to cover the day. I enclose details of our car coupling arrangements for the 5" gauge stock - the 7.25" arrangements are somewhat similar.

Car parking, toilet, and limited kitchen facilities are available on site.

#### How to get there

Cheadle Hulme lies on the southern edge of Manchester and is just to the east of Manchester Airport. The track is off Stanley Road, the B5094, a few yards east of its junction with the A34 Manchester to Stoke-on-Trent road. Buses run past the track which is about 4 1/2 miles from Stockport Station. (See map on page three).



scale 1" = 0.6 mile (approx).

AUG 1996.

## Coupling Details

I've been a bit lax in this department in the past - not being a loco owner I tend to overlook what may be considered to be obvious details. Normally, you would ride your driving trolley behind your Lion, with perhaps a passenger carriage behind you. However, for the competition, you will be seated on the Guildford dynamometer car, kindly loaned by that club and transported to Stockport by David Neish. In either case, you will need to connect up to the Stockport passenger carriage. Below are details of the dynamometer car and the Stockport passenger carriage connections are shown on page five, so be warned!

### G M E S DYNAMOMETER CAR

The car is a 4-wheel truck, designed to carry the driver. It is coupled to the loco at the front, and normally pulls a passenger trolley on which sits the Observer and any passengers.

The front of the dynamometer car has two large plastic blocks to act as buffers. These extend from 2" to 3 5/8" above rail head, and over a width of 8" centred on the 5" track, with a gap of 2 1/2" in the centre.

For a 5" loco the coupling is a forked clevis 1/2" wide, with a vertical gap 1/2" wide in its centre and a horizontal hole 3/16" diameter (for a split pin) located 3 5/8" above rail head and 1/2" in front of the buffers when there is no pull. Coupling is usually by means of a strip, 3/16" thick, with a 90 degree twist so that it can couple to a horizontal clevis on the loco by means of a pin not more than 3/16" diameter. Strips with lengths of 1 1/2", 1 5/8", 2 1/2" & 2 7/8" are available.

For 3 1/2" locos, there is a smaller clevis, 1/2" wide with a 1/2" slot located 2 7/8" above rail head and 7/8" behind the line of the buffers. In use the slot in the small clevis is at 35 degrees from the vertical, and a coupling strip is available with a twist to fit a loco with a horizontal clevis. This strip is for tracks where the 3 1/2" running is towards the right of the 5" track; it is 3 1/2" long and 1/8" thick, with a 3/16" hole.

As a less-satisfactory alternative, small chain may be used in either clevis to couple to a loco with a hook. In this case arrangements should be made to prevent the chain from disengaging from the hook.

### To sum up

Saturday, 15th August - 10.00 am to 5.00 pm;

Stockport & District SME track in Stanley Road, Cheadle Hulme;

2 1/2", 3 1/2" & 5" gauge raised level aluminium tracks;

7 1/4" gauge ground level steel track;

Coal will be made available, or you may bring your own;

There will be a table set up for those who may wish to exhibit static items.(ie, boilers, wheels, etc)

Driving trucks - 3 1/2" and 5" - use the passenger cars; 7 1/4" - a couple available, but you may bring yours to be certain;

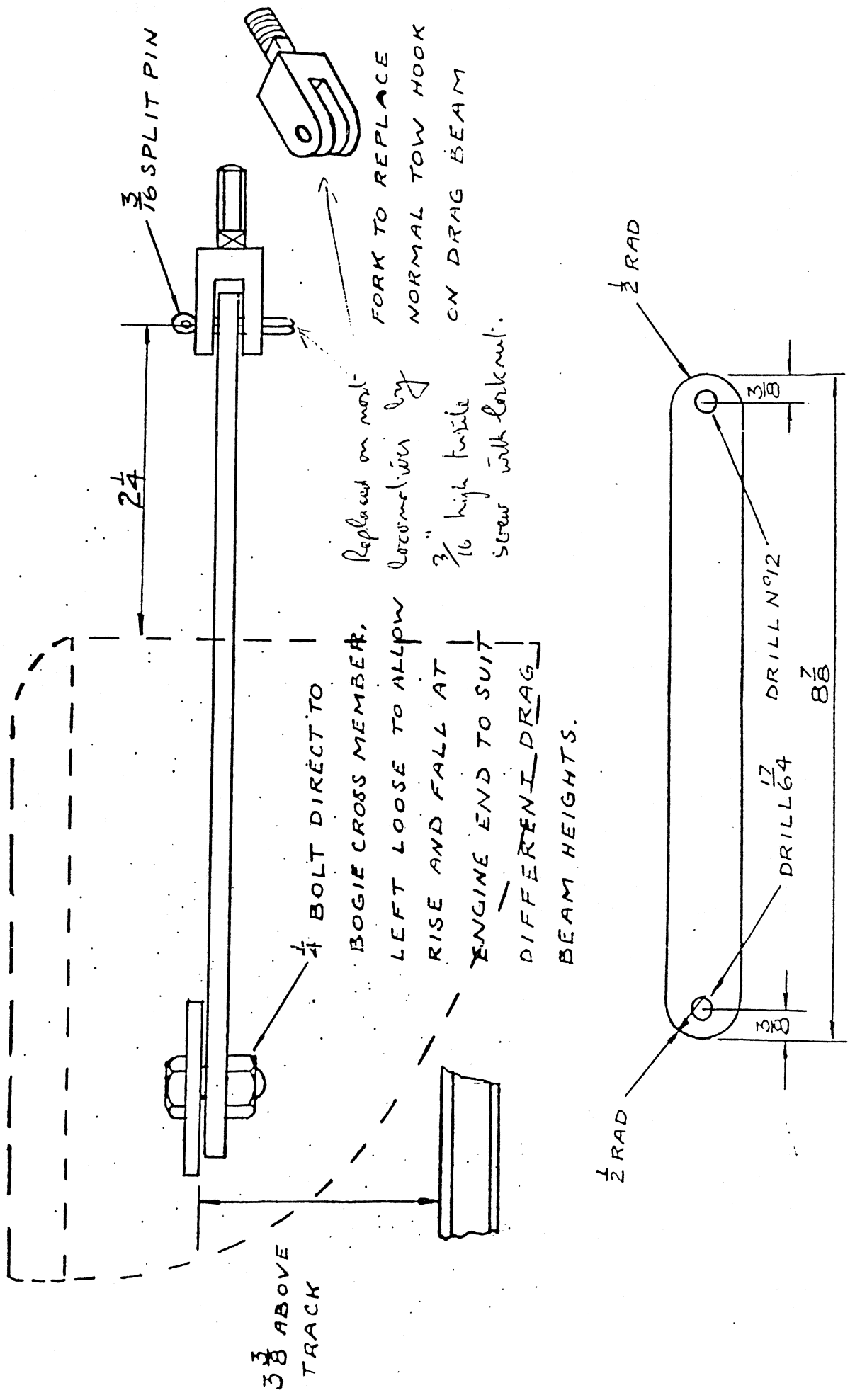
Refreshments - There is a facility for heating water, but bring anything else you may need;

Prizes for winners in each gauge;

Boiler certificates for all engines in steam will be mandatory.

If you have any queries, please don't hesitate to ask me(details on back page).

METHOD OF COUPLING PASSENGER TRUCKS TO ENGINES AS USED BY THE STOCKPORT AND DISTRICT SOCIETY OF MODEL ENGINEERS.



# THE OLD LOCOMOTIVE COMMITTEE

## MINUTES OF THE FOURTEENTH ANNUAL GENERAL MEETING

The 1998 OLCO AGM was held in the Lecture Room of Liverpool Museum, William Brown Street, Liverpool, on Saturday, 16th May. Members had been busily engaged on the cleaning of Lion in the adjacent Transport Gallery from opening time until shortly before the meeting commenced.

Present:-

From the Old Locomotive Committee:-

E F Clark - Chairman;  
Jon Swindlehurst - Treasurer;  
John Hawley - Secretary;  
David Neish;  
Charles Taylor-Nobbs;  
Lionel Waldrige;  
Peter Mountford.

From National Museums and Galleries on Merseyside:-

John Kearon - Head of Shipkeeping, Industrial and Land Transport Conservation;  
Justin Garside-Taylor - Head of Industrial and Land Transport Conservation.

The Chairman opened the meeting at 2.00pm by thanking everyone for their attendance in spite of the rival attractions of the Cup Tie, the excellent weather and of course, Lion, newly sparkling in the next door Transport Gallery after the morning's cleaning session. He warmly thanked John Kearon, Justin Garside-Taylor and Sharon Brown of the museum for their hard work in preparing for the meeting and for allowing us to use the Lecture Theatre. He extended an invitation to those who were able to attend the OLCO annual dinner that evening.

### Apologies

Apologies for absence were received from Geoff Wright, John Beddard, Susy Parrott, Les Dalton, Vernon Smallwood and Ivan Fletton.

### Minutes of Twelfth AGM

A correction was requested by David Neish who stated that expenditure on the AGM Dinner in the financial year ending 31st March 1997 had been stated at the AGM to be £117.00, but had been recorded in the Minutes as £17.00. The Minutes were amended in manuscript by the Chairman. The Minutes were then taken as read and were duly signed by the Chairman.

### Matters Arising

There were no matters arising as a consequence of the above Minutes.

## Museum Report

John Kearon was invited by the Chairman to give his report at this point, so that he could then see to other matters.

John thanked those present for their attendance at the third OLCO AGM to be held at the museum. He stated that he would be quite happy to see this becoming a permanent arrangement, especially combined with the cleaning session.

For the cleaning of Lion that morning, OLCO members had been restricted to ground and footplate levels only - ie, the chimney could not be cleaned. This was due to Health and Safety Executive regulations restricting the height at which one may work without scaffolding of some description. HSE rules affected a great deal of the museum's previously routine activities, particularly in lifting, access, climbing, etc. and was not limited to museum staff. Perhaps in the future members would have access to the chimney, but it would need to be via some sort of gantry, railed if above a certain height.

The museum policy is that the Gallery is cleaned on a six week cycle, using a vacuum cleaner and magnetic cleaning dusters. However, Lion had been left for a while, pending OLCO's visit. He thanked members for their efforts in the morning.

There had been no significant change in staffing levels - one post still remained to be filled, though that should be resolved soon. John apologised for any apparent lack of communication in recent weeks. Workload was keeping him extremely busy. Liverpool Museum was in the middle of its lottery bid. Graham Boxer is now the new Keeper. Lion was to be kept in place for the foreseeable future and to be maintained in good order.

The third class carriage was still in the workshop at Albert Dock. Work on it had been delayed for some time due to risks involved in the removal of old leaded paint. The problem had now been resolved and work restarted. All parts of the carriage were being treated so that future work would be restricted to minor repairs. It was hoped that the vehicle would be back on display this summer.

At the end of his presentation John invited questions. E F Clark asked that OLCO's greetings be passed on to Sharon Brown and others involved in helping with arrangements for the AGM. He then asked if any progress had been made in identifying the wood employed in Lion's frames. John Kearon replied that the botanist was having difficulties. He may need a larger piece of wood to establish the species, but would probably be unable to establish the sub-species. It is almost certainly greenheart, which was also used for the dock gates. In any case, it was not easy to obtain wood from Lion of sufficient size to be of much help.

E F agreed with J K that the third class carriage was an interesting vehicle, with its lightweight under frame. The design and workmanship were very good, though perhaps not all original. Could it be measured and photographed? John would see what photos could be arranged. Meanwhile it was agreed that John Hawley should be given access to do as much measuring on the Sunday morning as he could manage in the brief time available, under the care of Justin Garside-Taylor.

John Hawley asked if the front buffer beam on Lion was of significant interest. John Kearon said that it was of oak and was not original.

E F Clark thanked John Kearon for his interesting report.

## Chairman's Report

E F Clark opened his report by inviting museum staff to Lionsmeet at Stockport on Saturday, 15th August. Details and maps would appear in the forthcoming issue of Lionsheart.

The Peterborough Lionsmeet had been an extremely successful event. It had been good to see two new cups for the competition. The old Chairman's Trophy had been presented to Susy Parrott in memory of Mike. He hoped that John Swindlehurst would report on the progress of boxes for the cups during his forthcoming report.

E F paid tribute to the hard work and excellent display by Sharon Brown at the showing of the film Titfield Thunderbolt on 21st November last. This formed part of the Liverpool Philharmonic's season of classic films and was well attended.

Sharon had recently reported that the sample of Lion's tyre material had been despatched to Dr Shelton in Sunderland during the past fortnight.

The Lion cleaning session had progressed well during the morning. It was to be hoped that this could become an annual event, giving members the chance to get really close to Lion and to study her construction.

E F closed his report by thanking Peter Gardner and officers present for their efforts during the past year.

## Treasurer's Report

Jon Swindlehurst presented the balance sheet commenting that profits for the year ended 31st March 1998 were down on previous years due to the purchase and preparation of the new trophy for the 5" gauge Lions. This expense would not occur again for many years.

Membership renewals had stayed relatively constant, though five were still outstanding. About 60% of members had opted for the 5 year scheme. Taking into account the overall good state of OLCO finances Jon looked forward to an interesting year. He invited questions from the floor.

David Neish expressed concern about the 5 year subscription payments. Were they being accounted as one off payments or being spread over the five years? Jon replied that they were one off payments, so that we would have little or no income for the next four years. However, there had been several late payments for 1998, so that next year's statement would still show some income. There may also be income from stock sales.

David suggested that an advert be placed in Model Engineer regarding the forthcoming Lionsmeet. John Hawley felt that the expenditure would not generate any significant income. After some discussion, it was agreed that the advert should be placed, members agreeing with David that it was important that OLCO's name be kept in reader's minds. John Hawley agreed to take the matter in hand.

The Treasurer suggested to the meeting that funds be transferred from the current to the deposit account, in order that income due to interest be increased. Charles Taylor-Nobbs agreed, saying that apart from the Lionsmeet advert, there was little immediate call on OLCO assets. Details were left to the Treasurer's discretion.



OLCO FINANCIAL STATEMENT for the year ending 31/03/98

<u>INCOME</u>	<u>1998</u>	<u>1997</u>
Subscriptions	£273.00	£188.00
Deposit account interest	73.19	67.46
Donations	5.00	5.00
A.G.M. Dinner	-----	117.00
Sales receipts	<u>4.00</u>	<u>49.85</u>
	<u>£355.19</u>	<u>£427.31</u>
<u>EXPENDITURE</u>		
Advert in M.E. re: Lionsmeet	-----	45.53
Cost of Archive copies of scale model trains	-----	6.20
A.G.M Dinner	-----	126.35
Costs of producing Lionsheart	55.70	36.00
Donation to Thorpe Hall	25.00	-----
New Trophy	183.45	-----
Engraving	47.00	-----
Treasurers expenses	8.00	-----
	<u>£319.15</u>	<u>£214.08</u>
<u>NET PROFIT</u>	<u>£ 36.04</u>	<u>£213.23</u>

ASSETS AND LIABILITIES

CURRENT ASSETS

Cash at Bank ----	Current Account	£750.05	£838.73
Cash at Bank ----	Deposit Account	1939.68	1866.49
Stock in hand		173.45	177.45
Cash in hand		6.00	-----
		<u>£2869.18</u>	<u>£2882.67</u>

David Neish proposed acceptance of the Treasurer's report. This was seconded by Peter Mountford. The motion was carried unanimously.

### Subscription Rates for 1999.

The Treasurer suggested that subscription rates be left as is. Funds were adequate for the foreseeable future. The meeting agreed.

### Election of Officers

The Chairman reminded the meeting of the present list of Executive Officers, stating that they were all willing to stand for the coming year. Charles commented that the Secretary had only one year of office remaining. Members should begin to think of a replacement to be 'trained up'. The Chairman agreed, adding that he was willing to discuss the matter in private with members if they so wished.

EFC paid tribute to the past efforts of Peter Gardner as Modeller's representative in arranging recent Lionsmeet competitions. He wondered if there was a need for the post vacated by Peter to be filled. Charles expressed the view that the Modeller's Representative should be a member of a club and in touch with people from other clubs. After some discussion, it was agreed that the Secretary, if re-elected, should carry out these duties for his remaining year of office.

EFC offered the retiring officers to the meeting. They were re-elected without dissent. Peter Mountford was elected as Executive Member to carry out such duties as the Committee from time to time should decide. The Executive Committee for 1998 now stands as follows:-

Chairman	-	E F Clark;
Treasurer	-	Jon Swindlehurst;
Secretary	-	John Hawley;
Co-Opted Member	-	Peter Mountford.

### Any Other Business

David Neish asked if there would be details of accommodation for the Stockport Lionsmeet in the next issue of Lionsheart. The Secretary agreed to look into the matter and publish what was available.

Jon Swindlehurst said that he still had to produce a box for the 5" Lionsmeet trophy. Oak or greenheart should be used if at all possible, especially if it could have some history behind it. Justin offered to look for suitable material if Jon would let him know the sizes. Jon also took it upon himself to acquire the 7 1/4" trophy from Les Dalton in time for Lionsmeet '98 at Stockport, since Les would be unable to attend.

There being no other formal business, the Chairman thanked the Museum for their attendance and for the use of their facilities, especially for the excellent 16mm projector which would be used for the film show immediately following the AGM.. The meeting was declared closed at 3.00 pm.

Following the AGM, we were splendidly entertained by 16mm films shot by E F Clark in India, Switzerland and the UK, with live commentaries. The Indian film was shot from the cab on the Bombay - Poona electrified line up the Ghat. The Swiss film was another cab ride, this time up to the Gotthard tunnel. (E F later showed us the pathing diagram for this route - how they do their maintenance I cannot imagine - there's a train every few minutes, even at night. I should have taken a photo of it, just to show you). The third film showed Lion at the Rail 150 Celebrations in the presence of many other interesting and historical locomotives.

### The Annual Dinner

On the evening of the AGM we once again took ourselves off to the Casa Bella in Victoria Street for the Annual Dinner with our museum guest, Justin Garside-Taylor. As usual, the food and service were excellent, though I nearly paid twice for some of it, due to a minor confusion. You have to be so careful after a good time...

### The Sunday Visit

Our habit of recent years, to wit a visit to something of interest to our members did not take place this year. We have covered several items of interest in Liverpool in the past. This time we had the opportunity to gather first hand information on the third class carriage that is hauled behind Lion when she is steamed. This has been in the museum's workshops undergoing restoration for some time and the body has been lifted off the chassis which is therefore easily available for examination and measurement. I spent a very happy morning there measuring the chassis so that an accurate drawing may be produced for record purposes. In this task I was ably assisted by Lionel Waldrige with some assistance from his wife, Ann and Justin in the form of tea and anecdotes. The drawing is complete as far as the information gathered takes it, so now I am awaiting more information from Liverpool. When complete, I shall print it in Lionsheart for your information. The vehicle is interesting in that the towing and buffing loads bypass the chassis side members. Thus the structure may be made quite light and still perform its function of supporting the bodywork.

### Readers' Letters

From Jon Swindlehurst

Wirral

Re the letter from Mr Ferre Fredrickx. I hope I'm reading the letter correctly but it seems to me that he doesn't really have a problem. My own Lion will only reverse when the wheels are in a particular 100 degrees of movement. If I happen to stop with the cranks in the wrong position the engine is simply pushed the short distance required until the lever will move. Speaking to people who have driven the full size Lion, they report a similar problem and reversing is usually done as the loco is just coming to a halt while the wheels are still turning

From Desmond Hill

Beaconsfield

Thank you for No. 44 - jolly good read as always - your efforts are appreciated!

Yours ever.. Desmond Hill. Fairground Ride Operative (Licence Pending).

Thankyou for your kind remarks Desmond. I refer readers to Lionsheart issue 44, page three, para 1 of the article headed "All the Fun of the Fair" to seek an explanation of the "Fairground Operative" bit. (The question of safety legislation at miniature railways is still running and I will try to report further in a later issue. Ed).

Your correspondent Ferre Fredrickx has done exceptionally well with his 5" *Lion* but his problems do highlight a matter that perhaps we ought publish in *Lionsheart* on a more regular basis.

L.B.S.C. never actually built this particular design of his, otherwise he might have spotted a most irritating design flaw. L.A.Saxby drew attention to the problem in his article 02/10/70 136/3402 pp.948 – 951. (see pp. 10 & 11 *L/heart* No.44).

There are two errors in the published design. The first is the gabs themselves. They are actually inclined planes and not a bit of Victorian frivolity with curved working surfaces as drawn and described so flippantly by LBSC.

The second is the gab link, although scaled, by slide rule, quite accurately from the BR drawings provided by his friend Mr.Riddles, it is too short.

When the gear lever is operated one pair of gabs are either lifted off or dropped onto the levers operating the 'wagging bananas' working the valve rods. The other pair are either lifted onto or slipped off the other end of those same levers.

Now it is impossible for these levers to move fully forward or fully backwards if there is a gab face in the way. Jamming is inevitable. The answer is to lengthen the long link between the gabs and the levers attached to the back of the cylinders, and operated by the gear lever on the foot plate. This ensures that the gabs pointing this way ^ are lifted well clear before the lower gabs can begin to engage the levers operating the 'wagging bananas' which work the valve rods.

Many years ago David Neish drew my attention to Saxby, fortunately before we had begun to make the gab gear. He advised experimenting with cardboard cut outs and dressmaking pins. This proved to be very sound advice.

Charles further writes to say "Yes" to my question in the last issue "Is there a Northern Fed". They celebrated their Golden Jubilee year in 1995. Their address is:-

The Northern Association of Model Engineers,  
c/o 4, Mellor Brow,  
Mellor,  
Blackburn,  
BB2 7EX.

-----  
**LIONSCLEAN** (Is this a new word, Charles?)

On the Saturday morning immediately preceding the AGM, a group of us huddled together in the early hours - well, about 9 o'clock actually - in the shadow of the main staircase up to the museum main entrance by a side door to await entry into the Transport Gallery where *Lion* is stored. We had a Special Purpose. That was to clean our *raison d'être* - *Lion* herself. We were given specially impregnated brushes, Brasso(Safe), cloths, overalls and ORDERS. We were to clean *Lion* as far as we could, though we were not to venture higher than footplate level. This meant that we could not clean the flared brass chimney top, but we could reach most of the rest of her. We went to work with a will and in three hours did a pretty fair job I think. We even got as far as cleaning the tender and the carriage behind. It was hard work of course - we are not quite as supple as we were - and there was a lot of stretching and bending. Anyway, she looked much improved after our efforts. We hope to do the same during another visit, perhaps a future AGM or something. See photo, page 15.

## WHAT GOES AROUND COMES AROUND AND AROUND.

The dissertation on Lionwheels in *Lionsheart No.44* was most interesting and proves, if it proves nothing else, that OLCO still has a great deal to do. The hypotheses expounded on the 12" to 1 ft. scale ones are very arguable and those expounded on wheels for the models beg far too many questions.

Firstly you and you alone must come to a firm and final decision about what you actually want. Do you eventually want to steam your creation at a *Lionsmeet*? Or do you want a glass case model perfect in every detail? Be under no illusion, even the cleverest and most superbly skilled amongst you CAN NOT HAVE BOTH in precise 1/8<sup>th</sup> scale in the same model.

*The 7 1/4 " Gauge Society* lays down 'GUIDELINES for the CONSTRUCTION and OPERATION of 7 1/4" GAUGE GROUND LEVEL MINIATURE RAILWAYS' Their wheel standards are a compromise for the 1/8<sup>th</sup> scale models that we make and the 1/4 and 1/3<sup>rd</sup> scale N.G. models made by those with a penchant for quarries and slate mines.

They require Narrow Gauge locos to have wheels with a Back to Back measurement of 6.75" and for models in 1/8<sup>th</sup> scale *e.g. LION* it is 6.813" (173 mm.)

The Smoke box is 51 1/2" wide or, in scale, 6.4375" (163.5125 mm.) which leaves 0.18775" (4.76885 mm.) of a gap either side of the smoke box and the back of the flange with the recommended BtB in use..

The space between the inside of each frame is 69.375" or, in scale, 8.671875" (220.6562 mm.)

This distance is reduced by the thickness of a horn plate on either side, a combined total of not less than 3 mm.

The suggested minimum wheel width is 0.813" (20.4 mm.). Double this, add the BtB and we get 213.8502 mm. fitting into a space 217.6562 mm. wide! This just clears the frames by 1.9 mm. (approx. 76 thou) either side. So it just fits, Hooray!

What about the width of the hubs then? Not to mention the thickness of that part of the horn block which fits inside the inside horn plate.

My cast wheels are about 20.2 mm. wide, or roughly 8 thou. too thin. And the hub on the driving wheel about 0.5 mm. thicker than the wheel itself, all on the outside face of the hub. Somehow or other that 76 thou. either side needs to accommodate another 2.5 + 0.5 mm. (120 thou.) either side!

The leading wheel has that classic 'farmyard' look at the hub. Mine has been skimmed down to 22.6 mm. wide, the minimum I dared go to maintain an authentic appearance. Somehow or other that spare 76 thou. either side now needs to accommodate another 2.5 + 1.5 mm. (160 thou.) either side!

Perhaps the flange behind the horn block does not need to be as thick as 2.5 mm. even at 1 mm. thickness the 60 thou saved is not going to go quite far enough to get within the 76 thou. limit that you have got.

Answer; Go to a lot of trouble to get the hubs spot on. Nobody will notice because they will be hidden behind the horn plates anyway, but you will have the satisfaction of knowing that your wheels are right.

The fact that your frames will have to be a good  $\frac{1}{4}$ " too wide is much more likely to get noticed. Very few people carry the prototype dimensions in their head or attend *Lionsmeet* with a vernier in their pocket. They then have to persuade you to let them get near enough your model the model to check

For real accuracy make a true scale set of wheels. The prototype ones are just 5" wide scaling at 0.625" (15.875 mm.) against the recommended 0.813" (20.4 mm.).

The flanges will also be scaled down in thickness, as will the hubs. These now have to pass, at speed, through check rails on track laid to  $7\frac{1}{4}$ " Society standards. You would really need to take your own track to *Lionsmeets* because  $7.25" \times 8 = 58"$ .

Four foot eight and a half is only 56.5" or 7.0626 gauge at  $\frac{1}{8}$ <sup>th</sup> scale

Anyone keen to form a  $7\frac{1}{16}$ <sup>th</sup>" Society? Maybe, with the millennium this close, it should be the '180 mm. Society', thus staying with tradition and remain fractionally over scale on the gauge. In this case by as much as 25.4 thou. (0.6125 mm.).

The advantages of using  $\frac{1}{8}$ <sup>th</sup> scale get a bit lost when trying for a perfect replica of an outside framed locomotive. The wrong basic track gauge is not noticed on an inside framed prototype. Perhaps a factor of 1.027 should be applied to all scale dimensions. This would give the extra width needed to the frames.

A 5" wide wheel becomes 0.642" (16.3 mm.) in width, still 4.1 mm. short of the desired norm of 20.4 mm., but getting towards what is required.

Thinking about this, now that it is getting more and more difficult to get materials in 'proper' *i.e.* imperial dimensions and even kids are allowed to take battery driven plastic brains into exams, is it really any harder to apply the 1.027 factor?  $56.5"$  divided by 8 = 7.0625 then multiply by 1.027 we get 7.2532 or 0.0032" under scale when using  $7\frac{1}{4}$ " track, barely the thickness of a piece of paper. Are you really working to those limits?

Let us look at the 8" deep  $\times \frac{1}{2}$ " thick flitch plates and axle horns. They scaled down beautifully when  $\frac{1}{16}$ <sup>th</sup>  $\times 1"$  steel was available. But try  $0.0625 \times 1.027 = 0.06419$  times 25.4 = 1.630 mm. 1.6 mm. is a common metric size and the 1" increases by 1.027 to 26 mm. instead of 25.4 mm. Frames 24 thou. deeper -Gosh!

We should now perhaps think of using a new scale of  $\frac{1}{7.79}$ <sup>th</sup> instead of  $\frac{1}{8}$ <sup>th</sup>. It would seem more likely to accommodate both the over scale track gauge and *recommended* wheel thickness problems caused by using  $\frac{1}{8}$ <sup>th</sup> scale frames, much more easily.

#### LASER CUT SPOKES.

Now I have not actually ordered any because, with my local college closing, I no longer had access to the required machinery. I did, however, manage to machine hubs with a slitting saw of appropriate thickness on a horizontal mill, using a dividing head and automatic drive. In effect this cut a square toothed 'cog' into which the spokes were to be forced with a 2 thou. interference fit. A circular plate would be fitted to either side and held against the sides of the hubs with 8BA bolts.

Would this have given the appearance of wrought iron bands on a solid hub? Is this what was done on the *LION* wheels? The wheel diameter was eventually going to be a 12" to represent the 8' drivers on the Crampton *Liverpool*. Casting that sort of diameter of wheel was likely to be tricky outside of a specialist foundry.

I had not got to the point of deciding to have the rim rolled or cut from tube. Either way a separate tyre would need to be turned. No doubt it would have been possible to work out where the ends of each spoke would come, mill a series of slots the appropriate distance apart, then roll or have rolled, the resulting strip. This technique would have been quite possible in 1838 and may even have been the way it was done on the full size wheel.

Ref. No. 12 on page 10 of Lionsheart No. 44. 17/12/53 is a letter from the late Mike Cox re scale wheels.

'L.B.S.C.' replied the following February in one of his articles that he was not describing a scale *LION*, but a miniature locomotive based on *LION* and that scale wheels would fly to pieces on the sort of tracks we had available.

Laser cutting had not been invented, Cast Iron is a very different material compared with Cut Steel. His designs did not envisage the forthcoming future popularity of 7 1/4" during the next 40 years, or the sophisticated equipment likely to be available to the average amateur, if not actually owned by him.

A final point to consider is the adhesive weight of the locomotive.

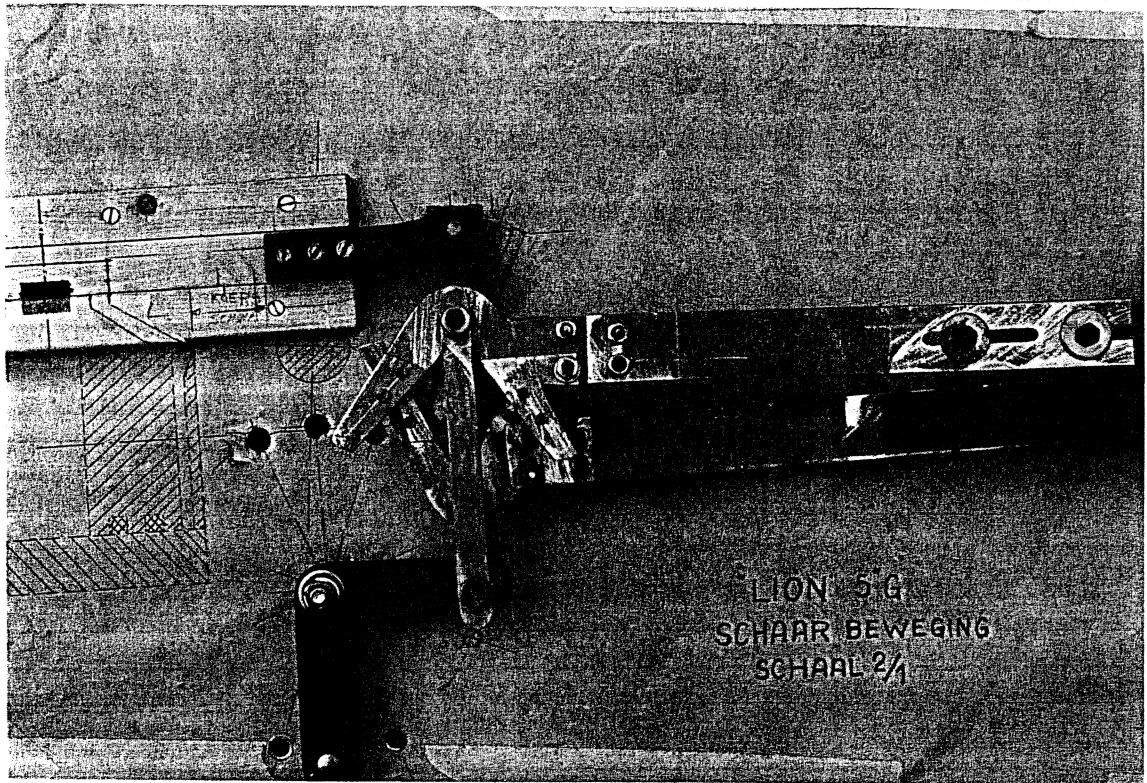
*LION* is a very small engine and you need as much weight as you can get wherever you can get it. I personally will compromise with cast iron wheels.

Laser Cut spokes might look nice, but they will deprive me of far too much valuable adhesive weight in an engine of this size.



The Polishers

In the gloom of the Museum and through the doom of the photocopier, we see, left to right:- David Neish; Lionel Waldrige; Ann Waldrige; John Hawley; Charles Taylor-Nobbs; Peter Mountford and E F Clark. (Photo: Jon Swindlehurst)



Ferre Frederickx's Lion Valve Gear. Ferre tells me that his 5" Lion is to LBSC design. He prefers to build, but for others to drive. He feels, if I understand his letter correctly, that his valve gear is either incorrectly built or is damaged. He has converted to Stephenson's expansion link valve gear, using the book by D L Ashton. The loco now runs on air, using 75% cut-off. (Photo: Ferre Frederickx)

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