



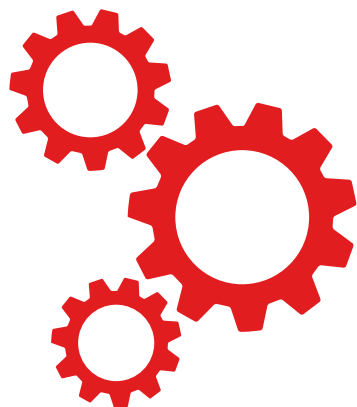
INTERNATIONAL FLAME RESEARCH FOUNDATION

2019

ANNUAL REPORT

Including financial statements





Legal status:

Company Limited by Guarantee; Company Registration No. 10573161

Registered office:

Ella Armitage Building, 40 Leavygreave Road, Sheffield, S3 7RD, UK

Bank:

Lloyds TSB Bank, SHEFFIELD CHURCH ST, Chelmsford Legg St OSC,
1 Legg St, Essex, CM1 1JS, UK

IFRF COUNCIL

Directors of IFRF Ltd (Group A)

General Secretary - Mohamed Pourkashanian*

Executive Director - Philip Sharman*

National Committee Representatives

America - Phil Smith

China - Yong Yan

Finland - Vesna Barisic

France - Sébastien Caillat* (IFRF Vice President - International)

Germany - Viktor Scherer

Italy - Massimiliano Fantuzzi

Netherlands - Jeroen van Oijen

Sweden - Fredrik Normann

UK - Roger Dudill

Non-Directors of IFRF Ltd (Group B)

President - Sauro Pasini*

Company Secretary - SUEL Ltd (Ross McMaster)

Co-opted Specialists

New fuels - Chuck Benson*

Safety - Jacques Dugué

Early Career Researchers - Karen Finney

Academia - Mikko Hupa

Regional (Asia) - Yong Yan

*Member of Executive Committee



IFRF 'surfing over' Covid-19

As for many of us, this Covid-19 period has given me time to reflect on the past, to remember friends and colleagues from my career, to reminisce...



Thinking back over my many years of links with IFRF, I recall, above all else, how I saw the future panning-out at various times. I must say, I would never have imagined seeing the transformations that I have witnessed in the course of my career. [cue dreamy music....]. It's 1985 and I have just joined IFRF's Heat Transfer Panel; electricity production in many countries is still nationalised and in the hands of the CEGB, EDF and ENEL, to mention the biggest, and in the combustion world there is still much to discover. IFRF is a pioneer in developing an understanding of industrial flames, from the basic processes to full-scale implementation. [dreamy music fades....]. In the years that followed, we were confronted by a succession of challenges to be addressed (or 'waves to be surfed') - energy efficiency requirements, 'acid rain' precursors (NO_x and SO_x), then new processes/new fuels, oxy-firing, co-firing, dedicated biomass combustion, energy-from-waste, ... and finally the 'era of CO₂'. Unfortunately there is not so much to do now on CO₂ - it's difficult to think of capturing it, so you have to start thinking of zero-carbon fuels (hydrogen, ammonia, ...).

Hang-on a moment... am I right? India has just announced that it is targeting a 16% increase in coal production in 2020-2021 and is installing new USC coal-fired power plants which will be producing electricity for the next two decades. In Asia, coal looks set to survive for many years yet and the same applies to gas all over the world (particularly given the back-up role demanded from combined cycle units). In the next 15-20 years, combustion as we know it will still play an important role in the energy equation, although it will have to be extremely clean and efficient, and will have to address the challenges that come with increasing hydrogen percentages.

Therefore, IFRF's strategy needs to both address the direction of travel towards a 'net-zero' carbon world and interact with (and make new members in) areas where more conventional combustion of fossil fuels still have a role to play - to act as a 'bridge' between these two worlds where the common denominator is flames/combustion. In this respect, IFRF needs to be relevant all around the world: to interact in China, to resume relations in Japan, to think about South America and India... It is essential for IFRF to link with regions and sectors that thirst for knowledge of combustion, and to help them to interact with those who have developed that knowledge and will lose it in time, as happens when it is no longer used.



Above all this, I think that IFRF should be a 'virtual' place or community of reference, where those who have flame problems can find those who have already solved them, with mutual benefit, and where the knowledge produced during these interactions is crystalised in documents that can then also be enjoyed by those who did not participate directly in the interactions. As an example, the great value of our Topic Oriented Technical Meetings (TOTeMs) needs to be captured completely in a web-based manner and transferred/promoted via our excellent Monday Night Mail (MNM) e-newsletter, which, as well as providing news and anecdotes from the combustion world, should contribute to transferring the current trends in the sector, helping members to understand what awaits us in the future.

One thing we can be sure of – life won't be easy! Post-Covid-19, combustion-related business (like all other business) will suffer from further economic constraints and it will continue to be difficult for IFRF to collect its membership fees and close its financial statements at the year-end, but I am confident that we can meet this challenge... more waves to be surfed!

Later this year – once IFRF has surfed over Covid-19 and life has settled back to some form of normality – my term as President will draw to a close: through some difficult moments I hope that my presidency has helped to consolidate the transition from Livorno to Sheffield, steered IFRF through the Covid-19 situation, and given useful suggestions to guide the path for tomorrow.

IFRF has been present in my life since that distant time in 1985, not only as an organisation, but above all as people, friends, specialists who have always helped me solve my problems, whatever they were, because everyone was always available – through IFRF – to help out, to help me surf some challenging waves.

I don't plan to disappear over the horizon – there is still much to be done to consolidate the reformed Italian Committee. However, I shall be pleased to pass the role of President into capable hands: in these years where scenarios of any kind move so quickly, dynamically, unpredictably, it is important to look to the next generation, to intellectual freshness (not too conditioned by the past), to the desire to face new challenges ...

Sauro Pasini, IFRF President



A successful year despite challenges

As I sit and think back over 2019, much of the world is now in lock-down due to the Covid-19 pandemic and, quite frankly, the world is a VERY different (and pretty scary) place. This puts the travails of 2019 into a very different perspective!

However, despite this caveat and a recalibration, 2019 was a challenging year for IFRF (I don't know what adjective I will be using in a year's time to describe 2020...).



We started 2019 with a bold, new, three-year, strategic plan in place and some 'stretch' targets and key performance indicators (KPIs) agreed with our Council against a very tight budget.

Unfortunately, from the first Quarter of the year onward, we encountered significant delays in receiving the annual membership subscriptions from four of our nine National Committees, with some payments delayed by up to seven months and one even past the end of 2019. This created considerable challenges for the Delivery Team in terms of managing our cashflow, and absorbed large amounts of our most limited resource – staff time.

Despite these challenges, a lot was achieved in 2019, although some KPIs were missed.

Early in the year, the University of Sheffield – the 'host' organisation of IFRF – secured (with IFRF's help) some £21 million of investment for a new 'Translational Energy Research Centre' (TERC) that will replace the PACT Facility and be the new location for IFRF from 2021. IFRF also became an industrial partner of a new UK Centre for Doctoral Training in resilient, decarbonised fuel energy systems, establishing three R&D 'mini-projects' with three Engineering Doctorate students. We signed an agreement with Gas- und Wärme-Institut Essen e.v. (GWI) to become IFRF's second 'preferred research partner'.

Over the course of the year, our membership increased by over 8% - two industrial organisations, eight academic institutions and one individual member. Meanwhile, our Associate Members Group (i.e. those member organisations that sit outside the 'geography' of our established National Committees) have gelled as a group, catalysed by a 'community plan' being launched.

A visit to Japan in September (on the back of my attending the American Flame Research Committee (AFRC) Industrial Symposium) proved very productive, with nine potential member organisations visited, together with the Japan Boiler Research Association (existing member) and IERE (IFRF partner organisation).



In addition to supporting the AFRC symposium, IFRF also supported actively 'Flame Days' or symposia organised by our Finnish, Dutch and German flame research committees (FFRC, NVV and DVV, respectively), as well as a well-received Topic Oriented Technical Meeting (TOTeM) – the 46th to date – on 'Waste-to-Energy' organised by our Comitato Italiano in Pisa, Italy. An event in the UK involving some eight other combustion-related organisations was also instigated by IFRF.

As well as events, we have expended a lot of effort on enhancing our communication activities. Our bi-weekly e-newsletter, Monday Night Mail (MNM), was 'refreshed' in July with a host of new features including guest editors from our National Committees, member profiles, etc., leading to a steadily growing and interactive readership over the second half of the year. Supported by our versatile and accessible new website, we have used MNM to promote some 132 IFRF and 227 Combustion Industry News blogposts during 2019. These outputs have formed the bedrock of our various social media channels, particularly LinkedIn (where we have a large and growing IFRF Group as well as a 'Company Page') and Twitter, the reach of which have grown by 35% and 19%, respectively.

During 2019, we also refreshed the Editorial Board and publication processes for our peer-reviewed, online journal, Industrial Combustion, publishing four papers towards the end of the year.

Within the governance of IFRF, we restructured our officer posts – creating a second vice-president position, with one focused on international matters and the other on research foci – and strengthening the cohort of Co-opted Specialist advisors on our Council.

Where our cashflow challenges did impact our activities was in our plans to develop training activities (both physical and virtual offerings). We were able to offer our members places on an early-career researchers training course on operating R&D combustion rigs, but other ideas had to be shelved due to reduced effort being available at key times in the year.

With the benefit of hindsight from the spring of 2020, the adaption of our *modus operandi* to suit our cashflow strictures actually right-sized our activity for the onset of the Covid-19 pandemic, although we weren't to know this at the time we were suffering from it...

Philip Sharman, IFRF Director



MEMBERS

IFRF has members in each corner of the world, from the USA to Japan, and from Finland to South Africa.

Here is how the IFRF Membership looked at the end of 2019:



**9 National
Committees**



140 Members
**(130 organisations
and 10 individuals)**





Member Survey 2019

In 2019, IFRF issued its second Member Survey, designed to gain a greater understanding of our members interests, needs and what they valued most from being part of IFRF.

Technical areas and market segments

Rank	Technical area of interest	
1 (=)	Environmental concerns	↑ 3
1 (=)	Heat transfer	↑ 2
3 (=)	Modelling and simulation	↓ 2
3 (=)	Fuels (solid, liquid and gaseous)	↓ 1
5 (=)	Flame aerodynamics	↑ 2
5 (=)	Flame chemistry	→ 0
7	Waste treatment and energy-from-waste	↓ 1
8	Safety	→ 0
9	Flaring	→ 0

Rank	Market segment addressed	
1	Power generation	→ 0
2 (=)	Chemical and petrochemical industries	↑ 1
2 (=)	Heat production	↑ 5
4 (=)	Cement and lime manufacturing and mineral processing	→ 0
4 (=)	Iron and steel production	↑ 2
4 (=)	Thermal processing industries	↓ 2
7	Glass manufacturing	↓ 2

13
responses

Results showed 'environmental concerns' was the hottest topic as it moved from fourth in 2018, to joint top. Also 'heat transfer' became a key topic amongst our members as it moved from third to joint first.

'Heat production' was the one that moved up the Market Segment table the most but it was unable to usurp 'power generation' which kept steady at the top. It's good for us to know what topics our members are interested in and which market they are operating in as it helps us tailor our offer to suit their needs.

IFRF events and communication activities

IFRF resources

Valuable

MNM
Newsletter

IFRF
website

Industrial
Combustion
Journal

IFRF
Conference

Quite valuable

Combustion
Handbook

Solid Fuel
Database

LinkedIn
Group

TOTeMs

IFRF report
archive



COMMUNICATIONS

IFRF has three main platforms for communicating with its members and the wider audience - *Monday Night Mail* (MNM) a bi-weekly member e-newsletter; the IFRF website (www.ifrf.net); and Social Media pages.

Monday Night Mail **1106** subscribers*

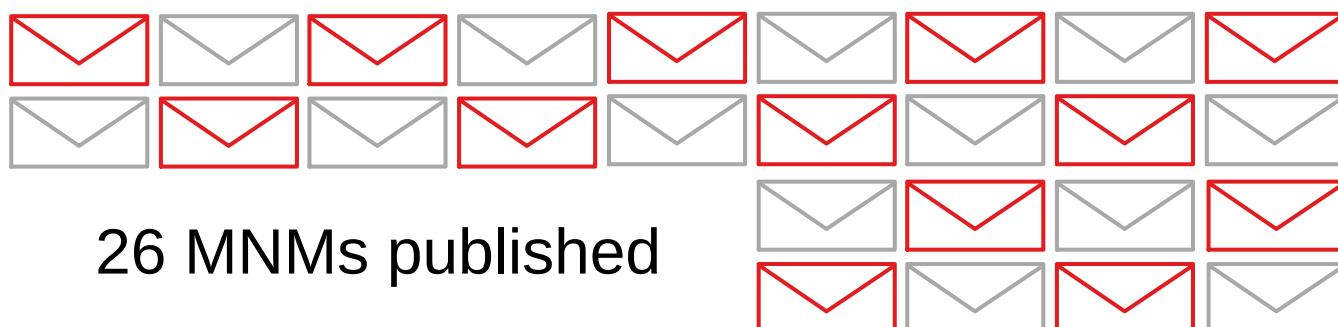
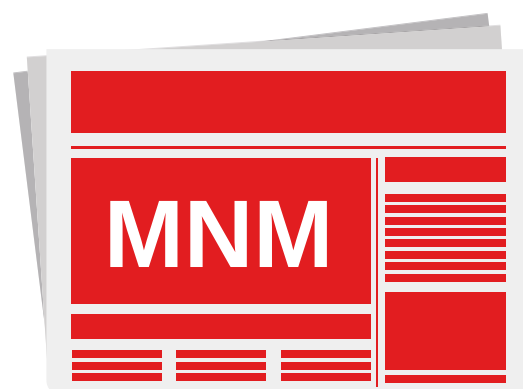
*average number of subscribers for 2019



On average **24.5% of subscribers** engaged with MNM...

Top 3 stories of 2019:

1. Energy-from-waste: UK's largest waste wood gasifier operational
2. Hydrogen and combustion: big challenge, big chance
3. Select-a-vector: will hydrogen win the race?





Website



Events calendar



News & Blogs



Member login

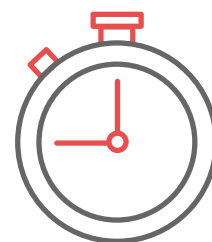


IFRF archive

Industrial
Combustion Journal

16,693 users visited the
IFRF website in 2019

Each user spent on average
2 minutes and 10 seconds
on the IFRF website



Top three countries
by number of users are:



Top page by views:



Top news item by views:



Total papers downloaded from the IFRF website - **408**

Social Media Networks

IFRF's social media presence focuses on four networks:



Twitter

280 followers

270,000 impressions

623 tweets

LinkedIn



284 followers

642 group members

377 articles



WeChat

Active CFRC group

21 followers

YouTube



16 subscribers

510 impressions

EVENTS & MEETINGS

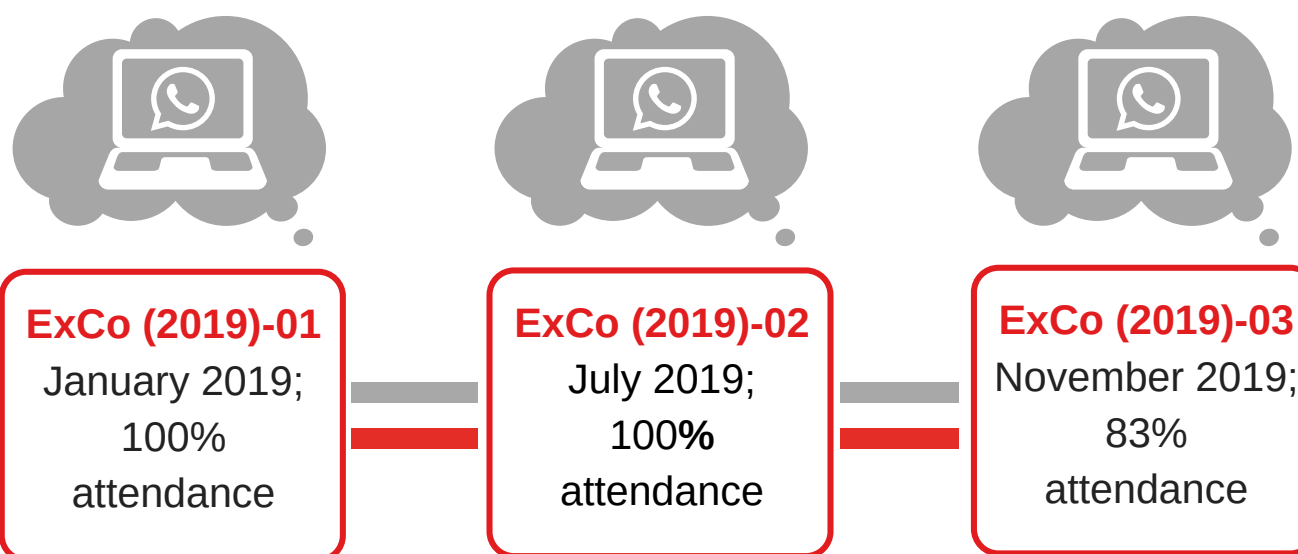
IFRF Council meetings

Two IFRF Council meetings were held in 2019:



Executive Committee (ExCo) meetings

Three ExCo meetings were held in 2019. All were held virtually.



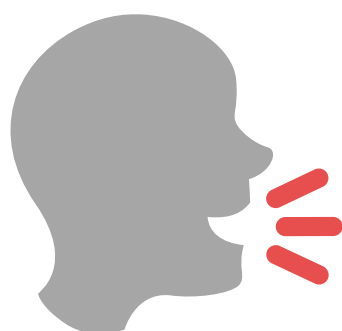
Topic Orientated Technical Meetings (TOTeMs)

TOTeM #46 - Waste-to-energy: Status and perspectives of technologies 21-22 November 2019; Pisa, Italy



40 attendees...

...from eight countries



12 presentations and many lively discussions

"Well organised + very interesting event"

"Interesting information" + "Good event"

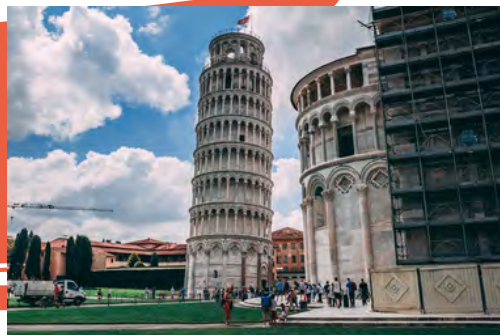
Two sponsors



National Committees Flame Days

In 2019, IFRF attended four National Committee Flame Days:

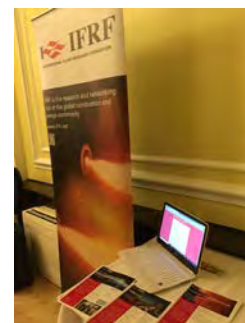
**Comitato Italiano
Combustion Seminar**
30 January 2019;
Pisa, Italy



**AFRC Industrial
Combustion Symposium**

8-11 September 2019;
Hawaii, USA

Clean Energy Lecture
7 October 2019;
London, UK



DVV Annual Meeting

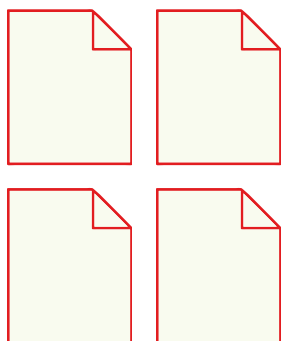
14 November 2019;
Stuttgart, Germany



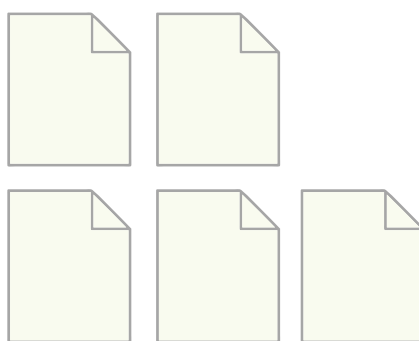
ONLINE JOURNAL

Industrial Combustion (ISSN 2075-3071) is the online journal of the IFRF and is dedicated to publishing the best research on the practical and theoretical aspects of combustion science in industrial applications.

Papers submitted in 2019:



4 papers published

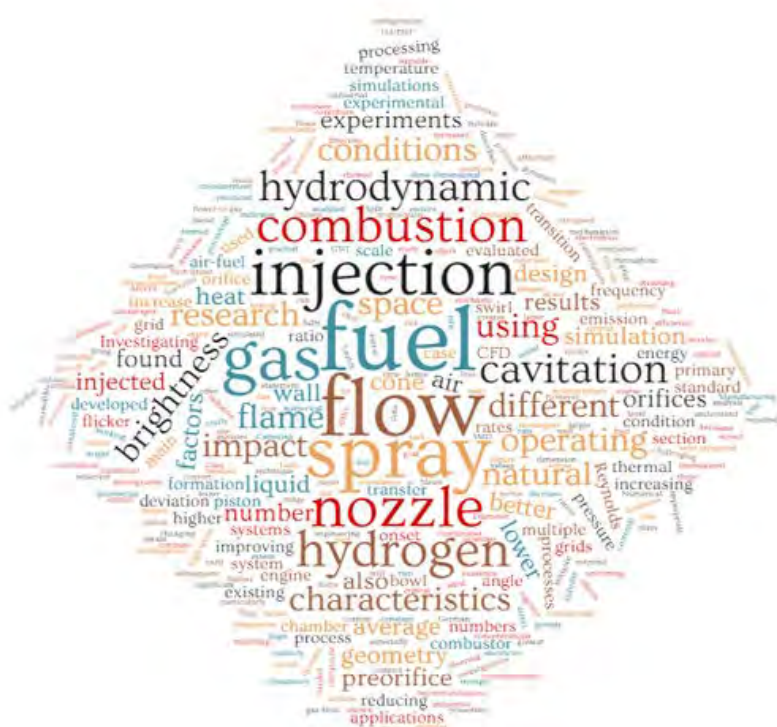


5 papers submitted



2 papers rejected

Keywords:



Editorial Board:



Editor-in-chief:

John Oakey,
Cranfield University

Plus 15 Editorial Board members



IFRF has eight primary research areas where activities are focused. Through TOTeM #46, the papers published in the Industrial Combustion Journal and IFRF Blog Series, IFRF has conducted activities in all these research areas.

Safety

IFRF published three flyers in 2019:





PROFIT AND LOSS ACCOUNT FOR THE PERIOD

1st JANUARY 2019 TO 31st DECEMBER 2019

	Actual	Budget	Variance
	£	£	£
Turnover			
Membership fees	127,105	145,531	(18,426)
Other income	1,974	13,000	(11,026)
Total	129,079	158,531	(29,452)
Operating Expenditure			
Director Salary / Fee	84,546	92,160	7,614
Admin Salary	33,808	33,603	(205)
Technical Meeting / Conferences	1,494	6,350	4,856
Research Services	10,790	10,340	(450)
Member Services	4,761	6,750	1,989
Legal and Professional	770	1,000	230
Accountancy and Company Secretary	9,042	10,572	1,530
Travel	9,446	9,996	550
Printing and Stationery	1,603	360	(1,243)
Insurance	1,803	1,941	138
Telephone / IT / Broadband	571	571	(39)
Rent	0	3,000	3,000
Capital Expenditure	0	500	500
Bank Charges	567	750	183
Bank Interest Receivable	(180)	0	180
Depreciation	153	0	(153)
VAT not reclaimable	0	0	0
Total	159,172	178,854	19,681
Surplus / (Deficit)	(30,094)	(20,323)	(9,771)



BALANCE SHEET AS AT 31st DECEMBER 2019

Fixed Assets	£ 115
Current Assets	
Debtors	24,780
Cash at bank	9,754
Total	34,534
Current Liabilities	
Short Term Creditors	61,073
Net Current Assets	(26,539)
Total assets less current liabilities	(26,424)
Long term liabilities	0
Total	(26,424)
Reserves	
Reserves	3,669
Profit and Loss	(30,094)
Total	(26,424)



BALANCE SHEET NOTES

BALANCE SHEET AS AT 31st DECEMBER 2019

	£ COST	£ DEP	£ NBV
(i) Assets			
Computer	458.98	344.21	114.77
(ii) Debtors			
Membership Fees		12,886.87	
			12,886.87
Payments & Accrued Income			
Insurance	-		
Italian Flame	11,443.04		
No Barriers Payment	450.00		
		11,893.04	
			11,893.04
(iii) Bank			
Current Account		9,753.90	
Deposit Account		0.00	
Credit Card		0.00	
			9,753.90
(iv) Creditors : Short Term			
Trade Creditors		16,074.93	
Credit Card		0.00	
PAYE / Payroll		959.15	
Deferred Income			
IFRF Membership Fees 2020	28,489.32		
Accruals			
Legal Fees	9,600.00		
Insurance - November & December 19	349.60		
Evenlode - December 19	5,600.00		
		15,549.60	
			61,073.00