8-1-1965

The Irish Plumbing and Heating Engineer, August 1965 (complete issue)

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An all-new Paxman steam boiler with a sister unit for water heating. An entirely new concept in design that gives year-through economy. Just light it up and leave it. With sensational new design features, the Paxman Autonomic packs big output into cupboard-sized dimensions. Purpose-built and purpose-designed to boost the productivity of heat-conscious engineers and all who live by boiler installation.

Coming from a company with a century-old reputation for quality, efficiency and economy, this latest addition to the Paxman range can be your guarantee of higher output at less cost, your guarantee of steam and heating progress.

Please write or call for further details of the Paxman Autonomic Steam Boiler and Water Heater.
See Sanbra Fyffe first
for all requirements in plumbing and heating services

on the site Plumbers fit the first choice
CONEX-INSTANTOR

CONEXCEL ADAPTORS
For converting standard Conex-Instantor Type ‘A’ fittings for use with soft temper underground Copper Tube to B.S. 1386.

COMPRESSION COUPLINGS
For use with Irish Domestic Copper Pipe and Polythene Tubes: Low Density to B.S. 1972, and High Density to B.S. 3284.

‘POLYDAPTORS’
Low Density Polythene to B.S. 1972 and High Density Tube to B.S. 3284 are easily and quickly jointed by replacing the compression ring with the ‘Polydaptor’ and using the flanged insert appropriate to the tube being used.

SANBRA FYFFE PRODUCTS ARE APPROVED BY THE LEADING ARCHITECTS, SURVEYORS, PLUMBERS, CONTRACTORS, GOVERNMENT DEPARTMENTS, MUNICIPAL AUTHORITIES AND WATER WORKS THROUGHOUT IRELAND.

SANBRA FYFFE LIMITED, CONEX WORKS, SANTRY AVENUE, DUBLIN 9.

Telephone: Dublin 375131 (5 lines) · Telegrams: Sanbra, Dublin. Telex: 5325.
Monsell Mitchell arrange September caravan tour

A MOBILE exhibition of equipment available to the heating trade in the Republic of Ireland from Monsell Mitchell and Co., Ltd., will visit five main centres during a two-week period commencing Monday, September 6, 1965. The tour itinerary includes Cork, Limerick, Galway, Athlon and Dundalk and installers will be invited to attend a special reception in the respective areas.

The focal point of the exhibition will be the new range of capital radiators and the new thermopak AI Accelerator manufactured by International Boilers and Radiators Ltd. Also on display will be Sigmund Pulsometer heating pumps, 'Fibreglass' insulation materials and 'Quick-Fix' double glazing.

This allows the installer to regulate the output of the boiler so that it more exactly meets the designed heating load. In some sizes this allowance is as much as 10,000 Btu/h.

When a boiler is range-rated, correctly, it works on a more continuous cycle without incessantly cutting in and out on the thermostat, thereby improving the effective efficiency of the unit (an important factor in keeping fuel bills to a minimum). This range-rating feature is unique and these new units are the first of their kind to appear on the gas central heating scene.

In addition to this innovation, the boilers—cartoned so that they arrive in the home in the best possible condition—are supplied with new casings all 36" high, the same height as the standard kitchen unit. The new boilers also provide warmth into the kitchen itself (in the largest sizes, as much as 4,000 Btu/h is dispensed as direct heat).

- New exhibitors at the Building Centre (Dublin) include Thermolag Ltd. and Sterling Heating Systems Ltd.

WHAT'S GOING ON DOWN THERE?

Turn to page four and see for yourself

Published by ARROW@DIT, 1965
LEADBURNING techniques have been improved in recent years. They have been simplified and made quicker and more effective. In sheet lead roofwork, leadburning can be used with advantage to make details such as chimney back gutters, front aprons, and the lead slates which are used to weather places where soil pipes and so on penetrate the roof. It is more convenient to prefabricate such details in a properly fitted workshop. Sizes and angles can be measured and noted from the actual building detail, and from these notes and sketches the job can be developed, cut to size, folded, and leadburned in the workshop. The finished details can then be taken to be finally fixed on the job.

In this way work can go ahead even when bad weather makes it difficult to work on the open roof; and it also means that the plumber can get on with his own work even when the other builder’s work such as chimney stacks, tiling and so on is not quite ready to receive the finished details. Leadburning is also helpful for prefabricating lead soil and waste pipework.

THE burning gases used for fuel may be hydrogen (in red cylinders labelled ‘hydrogen’); coal gas direct from the town supply or in red cylinders labelled ‘coal gas’; propane gas which, now that purpose designed leadburning torches are made for it, is being more used; and, for reasons given below, dissolved acetylene (in a maroon coloured cylinder) (Fig. 1).

The temperature of the flames (as used with oxygen) are as follows:

- oxy-acetylene: 3,200°C
- oxy-hydrogen: 2,200°C
- oxy-coal: 2,000°C

**Dissolved acetylene**, commonly known as D.A., is the most popular fuel gas for leadburning because it produces the hottest, cleanest flame. These properties are very important since the joint area must be clean before and during the leadburning process. D.A. has the added advantage that, with a suitable blowpipe, it can also be used for bronze-welding copper sheet and tube, and for welding mild steel tubes. For these reasons, and since there is little difference in operating costs between the various gases, oxy-acetylene equipment is now generally regarded as an essential item of a plumber’s workshop equipment.

Acetylene gas is highly inflammable, and is explosive when mixed with air. This must always be remembered, and the gas should be handled confidently but with respect. However, if the proper precautions are taken acetylene gas is quite safe to store and use.

**Acetylene** gas is unstable when subjected to pressure—it is liable to explode—and cannot therefore be compressed into cylinders in its gaseous form. The problem is overcome by first dissolving it in acetone—a liquid which will accept it readily—and then compressing the gas laden acetone. This is why the fuel is known as dissolved acetylene.

**Oxy-Acetylene Equipment**

1. Always store cylinders from damp and extremes of temperature
2. Stand clear when ’sniffing’ cylinder valves, i.e. clearing by blowing through before fitting regulator
3. Open cylinder valves slowly
4. Test for leaks with soap solution. Do not use flame
5. Keep blowpipe nozzles clean
6. Do not force blowpipe or cylinder valves

Two
Acetone will dissolve about twenty-five times its own volume of acetylene gas at ordinary atmospheric pressure—that is, at a pressure of 1 atmosphere (14.7 lb./sq. in.). The cylinders are usually charged to 15 atmospheres or 267 lb./sq. in. At this pressure acetone will dissolve 375 times its own volume of acetylene gas. When the valve of a connected blowpipe is opened, the pressure in the cylinder is reduced very slightly, and some of the acetylene escapes from the acetone to flow in gaseous form to the blowpipe nozzle where it may be ignited.

The distinctive, maroon steel cylinder is specially designed with a concave base so that it can be stood upright while it is being used. This is to prevent the liquid acetone from spilling out and along the hose to the blowpipe, as it could if the cylinder were used while laid on its side. This would not only waste costly acetone, but would also spoil the character of the flame. It could also lead to ‘lighting back’, with a grave risk of fire and, possibly, cylinder explosion.

If the cylinder chance to be seriously overheated, as it could be if heat were applied by accident to any part of it, instantaneous combustion might occur within it. As a safety precaution against this happening, the dissolved acetylene is divided into a multitude of tiny compartments. This is done by filling the inside of the cylinder with a porous mass such as kapok. The tiny pores accept the acetylene laden acetone, which is thus split up in near separate compartments. This simple device reduces the risk of the whole container catching fire at once. It also delays the spread of any internal fire and gives time to remove the cylinder to a safe place in an emergency. This usually involves taking the cylinder outside, opening the cylinder valve to release the internal pressures generated by the heat, and spraying the cylinder liberally with water in order to cool it.

A supply of oxygen is also needed for leadburning, and this is stored in special cylinders painted black (Fig. 1). These may have concave bottoms so that they will stand upright, but some may have hemispherical, convex bottoms. They used always be convex because this shape was considered best able to withstand the very high pressures to which fully charged oxygen cylinders are subject—about 2,000 lb./sq. in. However, the modern concave base is equally strong and is tending to replace the older shape of cylinder. Since there is no risk of oxygen burning, the oxygen bottle is not filled with kapok, but is simply a hollow shell.

Oxygen will not burn; its purpose is to support the combustion of the fuel gas. By carefully regulating the amounts of acetylene and oxygen, the flame can be brought to the required temperature and form.

It is important to be able to distinguish easily and quickly between apparatus used for acetylene and that used for oxygen. To help this, all painted parts of acetylene equipment are maroon coloured while those of oxygen are black. Since it is difficult to see colours in a bad light, extra identification is provided in the form of small machined notches or ‘kerfs’ on the hexagonal union nuts of acetylene equipment: unions for oxygen apparatus are quite smooth (see Fig. 1). This means that when you cannot tell cylinders and so on apart by sight, you can do so by rubbing your fingernail along a union nut.

The threads on all fuel gas connections are left-handed, whereas those for oxygen equipment are right-handed. This is another safety measure to prevent wrongful connection of oxygen equipment to the fuel gas cylinder, and vice versa.

Safety valves are fitted to D.A. cylinders, one in the concave base, and one in its ‘neck’ opposite the control valve. No safety valves are provided on compressed oxygen cylinders (see Fig. 1).

Pressure regulators are fixed on both D.A. and oxygen cylinders in order to regulate the outlet pressures from the cylinders to the hoses and blowpipes. They first reduce the high pressure within the cylinder to the relatively low pressure at which the blowpipe works, and they then regulate the pressure to keep it steady while gas is being used up at the nozzle. When the blowpipe shuts off, the regulator automatically adjusts itself against the pressure in the cylinder so that the pressure in the hose line to the blowpipe cannot exceed that for which the regulator has been set.

Most modern regulators work in two stages; that is, they have two stages of pressure reduction. The first stage brings the very high cylinder pressure down to about 100 lb./sq. in. and the second reduces this down to the low pressure at which the blow pipe works. For most leadburning jobs this would be about 2 lb./sq. in.

The regulator works on the principle of Boyle’s Law for gases. This states that the pressure of an enclosed mass of gas varies in inverse (opposite) proportion to its volume. To be strictly accurate, ‘the temperature of the gas

Continued overleaf
NEW ASBESTOS PIPES RANGE DEMONSTRATED

The Factory at Greenhills, Drogheda, of Asbestos Cement Pipes Ltd. is now in full production with Turnall Asbestos cement pipes for sewerage and drainage. These pipes take the place of the traditional short concrete sewer pipe which is often laid on an expensive concrete bed with numerous cemented joints.

The Turnall pipe is made four times as long with simple handmounted flexible couplings. The great strength of the Asbestos cement pipe, from one and a half to over three times the strength of the concrete sewer pipe, makes the use of concrete beds in normal circumstances unnecessary, thus saving considerable expense.

The smooth bore of the pipes and the freedom from leakage over long periods of the flexible joints made for economies in the design and cost of the sewerage system and for savings in subsequent maintenance expenses.

PLUMBING

From previous page remaining constant' should be added, since gases increase 1/273 in volume as their temperature goes up each 1°F, and thus increases their pressure against their container. This explains why safety valves have to be fitted to D.A. cylinders, and why kapok is provided to break up the mass of the gas, so that the risk of fire, with its accompanying increase in the gas pressure, is reduced.

The principle of Boyle's Law is illustrated quite clearly in Fig. 2. You can see that if you keep your thumb over the outlet of the syringe and at the same time push the handle end so that the piston travels halfway down the barrel, then the volume of the air enclosed will be halved and its pressure doubled. If you now draw the piston back, the volume of the enclosed gas is increased and its pressure decreased.

In the same way, if the pressure regulator passes just a small quantity of gas at high pressure into a space of greater volume, then the pressure will be reduced as the gas diffuses to fill the larger space.

This, very briefly, is the principle on which a regulator operates. When you screw in the control handle, the flexible, spring-loaded diaphragm pushes the

Gas Production

\[
\text{Ca}_2\text{C}_2 + 2\text{H}_2\text{O} \rightarrow \text{C}_2\text{H}_2 + \text{Ca} (\text{OH})_2
\]

Calcium Carbide + Water \rightarrow Acetylene + Calcium Hydroxide

(atmospheric air compressed)

- OXYGEN (nitrogen, argon etc.)

- ACETYLENE

-Calcium Hydroxide

- (made by fusing lime & carbon)

- evaporate at different temperatures

- are collected separately

Fig. 3 Leadburning - The Blowpipe & Nozzles

<table>
<thead>
<tr>
<th>Job</th>
<th>Load substance</th>
<th>suggested nozzle size</th>
</tr>
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<tbody>
<tr>
<td>flat butt or lapped seam</td>
<td>3 to 6 lb sheet</td>
<td>2 for Oxy-Acet gases</td>
</tr>
<tr>
<td>upright seam</td>
<td>6 to 10 lb sheet</td>
<td>1</td>
</tr>
<tr>
<td>inclined seam</td>
<td>6 to 10 lb sheet</td>
<td>3</td>
</tr>
</tbody>
</table>

Continued opposite
high-pressure valve off its seating to admit a small amount of gas at a high pressure to the large, low-pressure outlet space from which it will flow on to the nozzle. If the blowpipe valve is shut off, then the trapped low-pressure gas acts back against the low-pressure side of the diaphragm and helps the spring to close off the high-pressure inlet valve. As soon as the blowpipe valve is opened again the hose-line pressure drops, the pressure on the diaphragm drops, and a little more high-pressure gas escapes to the low-pressure side of the valve. When the blowpipe is in use, the valve ‘beats’—that is, it moves continuously back and forth—to meet any variation in the demand for gas on the low-pressure side.

The bottom diagram in Fig. 2 shows a simplified sketch of a single-stage regulator. This should make the working principle easier to understand. The only basic difference between the two-stage and single-stage regulators is that what is shown in the diagram is repeated twice in the two-tone ones. Although you might never have to draw it in detail, it is worth studying the sketch carefully, since it is always useful to know just how your equipment works.

With most pressure regulators, two pressure gauges are provided. One of these gives a direct reading of cylinder pressure, and is therefore useful since it indicates how much gas there is in the cylinder. The other will show the pressure to which gas is regulated on the low-pressure side of the regulator. This is useful, although not essential for adjusting the hose-line pressures for the job in hand (See Fig. 1).

Hoses will be needed to convey the low-pressure fuel and oxygen gases to the blowpipe. These are identified by their colour and hose union design (page 18) and are made of tough, canvas-reinforced rubber. The standard hose length is 15 ft., although it is possible to obtain shorter and longer lengths, within limits.

Flash-back arresters, sometimes called hose protectors, are now fitted to all fuel and oxygen hoses as standard items. These are simple, non-return valves designed to admit gases to the blowpipe, but to snap shut and prevent flame or abnormal pressure from damaging the hose should an accidental ‘backfire’ occur at the blowpipe.

It is worth noting that the larger bore hoses sometimes used for mild steel welding have the same size unions at both ends. It is therefore possible to connect the hose either way round. If the hose protector union is wrongly fitted to the regulator, then naturally its non-return action stops the gas from flowing into the hose line. This has puzzled many people, who have set up their equipment wrongly by mistake. Always make sure that the hose protector is at the blowpipe end of the hose.

The blowpipe, or torch, is the business end of the oxy-acetylene equipment. A good deal of the skill of leadburning lies on being able to adjust and manipulate this to suit the job in hand.

A blowpipe that has been used for many years is illustrated in Fig. 3. It is called the B.O.C. Model O blowpipe, and is produced by the British Oxygen Company. A blowpipe of this type is supplied with five interchangeable nozzles-numbered 1-5 in order of size—to give a variety of flames to suit different lead thicknesses and styles of leadburning. The blowpipe, together with pressure regulators, 3/16 in. bore hoses, clear goggles, spark lighter, kit spanners and so on all ready for use, costs about £30. This outfit can soon be recovered by the speed and efficiency with which it will, in the hands of a skilled plumber, joint sheet lead roof details and lead waste and soil pipes.

**SETTING UP THE EQUIPMENT**

1. Stand both cylinders upright, and check that surfaces to be coupled are free of oil and grease (If oxygen should leak, any oil or grease present would rapidly oxidize, and in chemical change heat would be generated. This could cause a fire, so watch this point carefully).

2. Insert the cylinder valve key, turn your eyes away, and without using undue force, open the valve for an instant. This is to ensure that any dirt collected in the valve will be blown clear, and will not get into the equipment. Do the same for the other cylinder.

3. Screw the regulators firmly into place in the cylinder outlets. Remember—the maroon, left-hand threaded regulator must be put into the D.A. cylinder, and the black, right-hand threaded one into the oxygen cylinder.

4. Couple the hoses to the pressure regulator outlets. Remember—the maroon one is for acetylene and the black for oxygen; and hose protectors must be at the blowpipe end in both cases.

---

**FACTS ABOUT AEROBORD**: As thermal insulation 1" thickness of Aerobord is equivalent to: 12" glass wool, 1.25" cork slab, 1.5" mineral wool, 1.8" softboard, 2.25" vermiculite, 2.5" wood wool cement slab, 3" strawboard, 3.5" asbestos insulating board, 6" vermiculite plaster, 40" brickwork, 50" concrete.

Manufactured in Ireland by SOUTHERN CHEMICALS LIMITED, ASKEATON

An igloo or mud hut? Not likely. But in case the impossible happens, you can rely on Aerobord to turn client’s folly into a haven of comfort. Aerobord, the versatile featherlight insulating material that makes civilised places habitable. And clients happy.
Unanimous—Whichever way you look at it the **LYNX** is today’s most popular cistern

Lynx high and low level cisterns are made of tough durable black Duranite that won’t craze, is non-corrosive. The Kingfisher siphon mechanism, made of polythene, gives a powerful flush, is non-corrosive, unbreakable. It can be used in both hard and soft water areas. The Lynx conforms to BSS 1125 and Water Works specifications.

Every genuine Lynx has the name engraved on the cistern

Other Shires products are the Uni-Lynx close-coupled suite, cistern fittings, plastic flushpipes and the Polyfloat cistern float.

*Available from all recognised builders’ providers in the Republic.*

Made by **shires**

IN IRELAND

SHIRES (IRELAND) LIMITED Stannaway Drive Crumlin Dublin

GOOD LOOKING

The Lynx’s clean cut lines are an example of contemporary styling at its very best.

PRACTICAL

The Lynx is the easiest to install; the concealed fitting is neat and simple.

EFFICIENT

Discreetly quiet with the most dependable mechanism ever.
Continued product development

THE "Oxford", a new medical washbasin in vitreous china, is the latest addition to Twyford's extensive range of sanitaryware. Measuring 28" x 16" overall, it embodies features new to this type of washbasin to comply with the performance specification prepared by the Hospital Inter-Board Study Group on behalf of the British Ministry of Health.

A grid waste replaces the more familiar standing-waste and there is no overflow. The deep bowl acts as an efficient anti-splash device, and all internal horizontal surfaces are sloped sufficiently to ensure adequate drainage into the bowl. All measurements are to the 4" module.

The Albany luxury washbasin in vitreous china is also new to the Twyford range. Measuring 28" x 16" overall, and with plumbing measurements based on the 4" module, it incorporates a right-hand shelf of generous proportions. The rear upstand, when flush to the wall, is high enough to prevent water seepage between wall and basin, while the deep bowl acts as an efficient anti-splash device.

Usually fitted on specially designed completely concealed brackets, the Albany can be supported, if required, on chrome legs with side rails for towel-hanging.

A new range of sanitaryware by Twyfords has been specially designed and manufactured to reduce the possibility of vandalistic damage to a minimum. In both Ceramant vitreous china and Adamant glazed fireclay, the range comprises washbasins, w.c. suites and urinals, and in each case full use has been made of every modern technique of protective installations, combined with foolproof fittings.

IDEAL-STANDARD Ltd. (Ideal Works, Hull, Yorkshire) have advised of a new bathroom suite which they have introduced. Catalogued under the name the Lincoln, the new suite has many interesting features which include a number of points usually only found in luxury products.

The suite closet is close-coupled to save space. The closet has a siphonic flush system and projects only 25 inches from the wall.

AN innovation in washbasin design by Armitage Ware Ltd. is the V4156L Myrel, made of virtually indestructable Armitage genuine vitreous china and incorporating a slimline Centreped leg which supports a modern oval-shaped bowl, generously proportioned for a maximum water content. Anti-splash ledges are incorporated to protect walls and floors.

Fittings available from Armitage Nuastyle range are attractive, chunky pillar taps at maximum 6" centres, or the G1060 series of centre mixer fittings with pop-up or chain waste. Armitage C724 concealed hangers, together with Centreped leg, support the washbasin. The size is 20" x 16".

A recent addition to the Armitage Ware Hospital range of equipment is the F882 Revolving Post Mortem Table. A special valve allows the unit to be revolved through 360 degrees, while an integral waste channel at the foot of the table supports a sufficient drainage in any position.

A new conception in baby baths—the Armitage F810 Teviot—is manufactured in Armitage Excelsior Glazed Ware and is guaranteed non-crazing, burn, stain and scratch-proof, and non-fading.

We note that the address of Mr. F. N. S. Ahern, agent in the Republic of Ireland for Armitage Ware Ltd., has been changed to 43 Charlemont St., Dublin, 2.

W. & G. Sissons Ltd. (St. Mary's Road, Sheffield) produce a standard range of catering stainless steel sinks which are of interest to industrial concerns, commercial catering companies and hospitals. Some of the standard sinks can be supplied with Continued overleaf

New attachment

A NEW hand spray attachment by Armitage Ware Ltd., Armitage, Staffordshire, supplied complete with wall hook, for use with the Armitage Nuastyle G1050 (as shown) and G1150 pop-up or chain-waste mixer fittings.

A special design enables the hand spray to be fitted quickly and without threading the mixer tap nozzle. The rubber plug fitment at the end of the flexible spray hose is inserted into the tap nozzle and expanded by turning the 1½" diameter rotating wheel underneath to give a firm, leak-proof grip.

The new fitting completely eliminates any possibility of "locking" the hand spray into the tap nozzle through stripping or forcing the threads.

Seven
heating arrangements to one bowl so that the sink becomes a sterilising unit. This does not mean, however, a hospital equipment sterilising unit, but a sink designed for pot wash and crockery wash, with one bowl so heated that the crockery, etc., has to be introduced to the bowl by means of nylon baskets. Any germs on the crockery are killed by the temperature of the water, which is rarely less than 185 degrees F.

All Sissons' sinks are made from sold, heavy-gauge Sheffield stainless steel. Usual features are splash-back and anti-drip mould; strengthened sound deadened drainers; radiused corners to bowls, etc. The under-structure is of tubular mild steel or stainless steel. The mild steel under-structure can be galvanised or enamelled. The sinks can be fitted on stainless steel or stove enamelled cabinets.

* * *

THE latest version of the first white plastic cistern which was introduced in 1957 by Fordham Pressing Ltd., Wolverhampton, is being marketed by the same firm. It is the Eterna—a perfect low level cistern, manufactured from Styrene. It has an extremely narrow projec-

<table>
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<th>PRODUCT REVIEW</th>
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<tbody>
<tr>
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<td>tion, measuring only 7&quot; from the back wall, and this enables it to be fitted where space is limited. It also makes it suitable for duct fitting.</td>
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</tbody>
</table>

Fitted with the Acquafloat polythene ballfloat and Fordham plastic syphon, the Eterna will operate in all conditions of water, even where sea water is used. The Fabula is a high level version of the Eterna. It can be supplied complete with a four-piece plastic flushpipe which packs inside the cistern. The Eterna Presto is a streamlined version of the standard Eterna with a special top-press action. It is extremely easy to operate, due to the reduction of friction to an absolute minimum.

Fordhams also offer their Uniterna—a distinctive close coupled suite incorporating the Eterna Presto cistern and the Ace plastic seat. It is stylish and compact, the overall length of the suite being only 26" from the back wall.

The Acquasave Mk.2 is a new ballvalve from Fordhams made entirely from Delrin (see Trade Topics). Fordhams are represented in the Republic of Ireland by R. T. Large, Stephen's Place, Rere 47, Merrion Square, Dublin, and in Northern Ireland by J. G. Linton, 8 Corporation Street, Belfast.

* * *

SHIRES Ltd., Guiseley, Leeds, have extended their activities into the sanitary pottery field, following the entry of Heathcote Ceramics Ltd., Longton, Stoke-on-Trent, into the Chloride Group, of which Shires have been a member for the last

Continued page ten.
WHATEVER SIZE & TYPE OF SINK YOU WANT MAKE IT!

STAINLESS STEEL MULTI-FLUTED SINKS

<table>
<thead>
<tr>
<th>Model</th>
<th>Size</th>
<th>Price</th>
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<tr>
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<td>18&quot; x 36&quot;</td>
<td>£12.0.0.</td>
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<tr>
<td>W</td>
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<td>N</td>
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<td>21&quot; x 84&quot;</td>
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STAINLESS STEEL INSET SINKS

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<td>FDL</td>
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VITREOUS ENAMEL SINKS

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<tr>
<td>VN</td>
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STAINLESS STEEL BOWLS

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VANITORY BASINS

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<tr>
<td>Ultra</td>
<td>17&quot; x 24&quot;</td>
<td>£7.18.0.</td>
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Taps and waste fittings extra

FISHER & LUDLOW LTD (Department T-S-V) BIRMINGHAM 24

Published by ARROW@DIT, 1965
The Irish Plumbing and Heating Engineer.

Our pictures give an indication of the range from Shires Limited. The view shows a new Shires showroom. Prominently displayed, in bathroom settings, are Shires 'Naiad' suite, with its 'Perspex' bath, matching washbasin and Uni-Lynx close-coupled toilet. Also on show are the Robin 'Perspex' baths, for which Shires now have marketing responsibility.

High and low level Lynx cisterns, in colour and black; the New Duranite and Hippo cisterns, both in black, are all displayed. Cutaway cisterns, including a glass fibre Polyflush flushing trough, show the working parts of these Shires units. A special display shows how Shires remote flushing control operates concealed cisterns, and the Company's range of seats and accessories can also be seen.

From page eight.

twelve years. Shires and Heathcote will work together in close association. Heathcote continuing to manufacture high quality vitreous china sanitary ware, and Shires adding the existing Heathcote products to its selling range.

Following the arrangements made earlier this year under which Shires took over the marketing of Robin baths, this new association considerably strengthens Shires' position in the sanitary equipment field. They will now be able to offer all the equipment for a modern bathroom in a wide variety of designs, both for new building and for replacements.

Ten

The Albany luxury washbasin by Twyfords.
A BALL valve which eliminates the risk of an overflowing water tank has been introduced by Fordham Pressings Ltd., of Wolverhampton. Moulded in several component parts from Delrin acetal resin, the patented valve mechanism will neither corrode nor stick, has very low moisture absorption and is silent in operation.

The Mark 2 Acquasave ball valve is the successor to the Mark I which has been used extensively for some years. It can be installed in any standard half-inch water supply system with high, low or medium pressures and in flushing systems or water tanks.

An advantage of the Acquasave is the ease of adjustability of the valve arm by means of a screw.

A ONE-DAY congress on domestic heating is being held in conjunction with the 5th National Domestic Heating and Insulation-in-the-Home Exhibition (organised by Clarke & Rhodes Limited), which takes place at the Free Trade Hall, Manchester, from September 14-18. The one-day congress is being held in the Lesser Free Trade Hall on Wednesday, September 15, and will be attended by installers of central heating.

Worthington - Simpson Ltd
6 WATERLOO ROAD, DUBLIN 4.

MAKERS OF THE LARGEST RANGE OF PUMPS IN THE COUNTRY

Eleven
Take a deep breath and . . .

SOMEONE once told me that if you are giving a talk or writing an article the thing to do was to make an impressive start and to have a good closing sentence or paragraph. Given these two essentials nobody would notice the bits in between. This is probably true but how does one set about making an impressive start? In any case when you are starting a series, as I hope this will be, does the impressive start go as far as the first paragraph or does the first article have to be impressive? It is all very difficult and I think that all I can do is to meander on as usual.

Domestic heating is not entirely a matter of precision, slide rules and earnest expressions. A little meandering may be a very good thing. Putting it another way, the design of domestic heating systems is not a science, it is an art based, if you like, on a science but still an art. This does not mean that I believe in long hair, studios and a general Bohemian outlook. What I am really trying to say is that I believe that domestic heating is so closely concerned with people that the human element becomes of prime importance.

I DO not remember ever hearing anyone defend the dignity of the trade but one can think of relatively few more useful or important occupations than giving people their own private climate inside their front door. Most thinking people agree, although it is perhaps old fashioned to say so, that the most important thing in anyone's life is their home.

The most important thing of all, of course, is "Home" in the sense of people; one's wife, one's children and generally the people around whom one's life revolves. But all this living has to be carried out in an appropriate setting and although the family circle around the open fire can be very pleasant, particularly at times like Christmas, in

Continued page twenty-seven.

The New THERMOPAK A1 Accelerator

Suitable for all domestic closed circuit heating installations from 15,000 Btu/hr. to 150,000 Btu/hr.

* The main features which make the THERMOPAK A1 a really outstanding pump:—

- High power-to-size ratio.
- Wide range of performance.
- Operational in any vertical or horizontal plane.
- Silent throughout entire output range.
- Measures only 7½" in length; weight 10lb. 8¼ oz.
- Two-year guarantee.

Available from stock at the sole agents:

MONSELL, MITCHELL & CO. LTD. Heating and Insulation Division.
67/73 Townsend St., Dublin, 2. Tel. 76282.
THE new Trianco SF.60 solid fuel gravity fed domestic boiler, rated at 60,000 Btu/h is the newest, most streamlined boiler Trianco have produced, setting a new high standard in home heating. The SF.60 has been designed to live happily in a modern house. This compact model requires a headroom of only 5' and a floor space of 22" x 19" and the rear fitted flow and return pipes simplify installation. The large capacity hopper holds 100 lb. of anthracite grains and can be adjusted to use peas or beans—thus cutting down refuelling to a minimum. Cleaning is easy and infrequent.

Special Trianco features include: large hopper, variable output forced draught fan, induced secondary air for improved combustion and efficiency, fan unit fitted in front of boiler and behind door for easy access and adjustment to blast control.

The SF.60 Boiler, having achieved high solid fuel combustion efficiency in stringent tests, is the result of a long-term research and development programme. The adjustable electrically driven fan controlled by a thermostat supplies the correct amount of air to the firebed to suit individual fuels at low pressure, for rapid, smokeless combustion.

- A NEW sixteen-page full colour brochure packed with ideas and advice on bathroom equipment and planning is now available from Shires Limited, the sanitary equipment manufacturers.

FOR YOUR DIARY

THE growing interest in home heating is emphasised by the subjects to be dealt with by speakers at the Third Plumbing and Central Heating Conference to be held on 7 and 8 October, 1965, at Alexandra Palace, London, in conjunction with the first International Plumbing & Central Heating Exhibition. Two speakers from the Heating Centre, London, will deal with "The Domestic Heating Industry" and "Space Heating" whilst other experts will discuss oil, gas, solid fuel and electricity as means of heating.

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A NEW sixteen-page full colour brochure packed with ideas and advice on bathroom equipment and planning is now available from Shires Limited, the sanitary equipment manufacturers.
The Temple System offers

Building Tolerance
The 'O' ring joint allows for plus or minus 1/4".

Heating Resistance
Withstands continuous discharge of boiling water.

Speed
Light weight and fabricated units speed up installation.

Efficiency
Pitch fibre pipe; Polypropylene fittings: both non-corrodible and non-electrolytic.

"Yes pitch fibre was specified!"

"of course, Temple pre-fabricated units with the new ‘O’ ring joints were used."

The Temple system for multi-storey 6" soil pipes speeds up the building operation dramatically. The Neoprene ‘O’ ring joint allows for building tolerances of plus or minus 1/4". Pitch fibre pipes are exceptionally light, and can be sawn, drilled or grooved on site using only hand tools—more speed, less cost, fewer labour charges.

Write to Temple Tubes for technical literature and learn about the unique fabrication and design service, the Neoprene 'O' ring joint and the Temple 'push-on' W.C. connector.

Temple Tubes
Limited

Temple Mill - Passfield - Liphook - Hants - Tel: Passfield 261
A THERMO-FLO Balancer specially designed for balancing multi-circuit or zoned forced circulation heating and cooling systems, is now being manufactured by Bell & Gossett Ltd., Works Road, Letchworth, Herts.

The balancer is a direct reading device and is calibrated in gallons per minute with a corresponding scale in litres per minute. A stainless steel spring indicator gives a positive indication of flow rate.

A special feature is the simplicity of the floor regulation. The unit is compact and can be installed in horizontal or vertical pipelines. Calibration limits are from 2 to 8 gallons, per minute, with ½ in. and 1 in. B.S.P. connections. The maximum operating pressure is 125 p.s.i. and maximum temperature 250 deg. F. For larger applications the range of Thermo-Flo Indicators is available in sizes 1½ in. to 8 in.

WAVERLEY Engineering Company Limited, Hyde St., Winchester, Hampshire, offering an Oil Powered Water Heater with a recovery rate four times faster than the much publicised 'high-speed' gas and even eight times faster than

Boyans of Harcourt Street are sole agents for the insulation products of the Cape Asbestos Group of Companies. The range of products includes: Rocksite and Rocksite-K rockwool materials, Caposite Asbestos Materials, Caposil HT and Caposil 1400 Calcium Silicate Materials, Asbestos Compositions, Rope Lagging and Cloth, Asbestolux. Consult us with your insulation problems.

Boylans of Harcourt Street, Dublin, are sole agents for the insulation products of the Cape Asbestos Group of Companies. The range of products includes: Rocksite and Rocksite-K rockwool materials, Caposite Asbestos Materials, Caposil HT and Caposil 1400 Calcium Silicate Materials, Asbestos Compositions, Rope Lagging and Cloth, Asbestolux. Consult us with your insulation problems.

M. A. Boylan Ltd
50a Harcourt Street, Dublin
Tel: 55408
A member of the Cape Asbestos Group of Companies

Continued overleaf
electricity. The operating costs work out at just a little under one gallon of gas oil per one hundred gallons of hot water.

The unit is good looking and well finished; it is completely automatic and is supplied in three sizes. The integral automatic in operation and is supplied in three sizes. The integral storage tank can be either glass lined or copper lined. The recovery rates range from 100 to 150 gallons per hour.

All glass lined models are equipped with a magnesium anode. Tanks are of heavy gauge steel, hydrostatically tested to 300 lbs. p.s.i., all fittings are of copper or brass. In copper lined models, the copper lining is encased in a heavy gauge high strength steel tank, forming an integral assembly. Water only comes in contact with copper, and flue gases only with steel. The unit is hydrostatically tested to 450 lbs. p.s.i.

* * *

TEMPAIR Limited, the Rootes Group air conditioning equipment manufacturers, announced the release to the home market of the new Pacific 102 wall/window mounting unit air conditioner.

An entirely new self-contained cooling and heating unit, the Pacific 102, with its classically simple styling, offers new standards of performance and efficiency in air conditioning at a very competitive price.

Of 1 h.p. 8,000 B.t.u./hr., capacity, the unit measures 26” wide and 161” high, with a depth of only 17”. The absence of side grilles permits installation flush with the outside wall if required.

One of its outstanding features is the option of either front or top air discharge of the conditioned air within the room. This ensures draught free, perfect circulation of air whether the unit is mounted at high or low level. Agents: L. Sterene & Co. Ltd.

* * *

FLOATSWITCHES

for controlling electrically driven pumps
Limit switches
Liquid level alarms
Motorised valve controls
etc., etc.

MERCURY TUBE and SILVER CONTACT types. Indestructible polystyrene floats. Floatgear also in stainless steel, copper, mild steel and polythene. Deliveries ex stock.

Generous discounts to the trade.
Stocked by most Electrical Wholesalers

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GIRDLESTONE PUMPS LTD.
WOODBRIDGE, SUFFOLK, ENGLAND
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INDUSTRIAL SECTION
CONTINUED PAGE 29
Northern Ireland
monthly review

Oil

The most economical
fully automatic
fuel for CENTRAL HEATING

Northern Ireland enquiries to:
SHELL-MEX AND B.P. LTD, 6 MURRAY STREET, BELFAST 1, Tel: 20881

Republic of Ireland enquiries to:
IRISH SHELL AND B.P. LTD, SHELL-B.P. HOUSE, 13/16 FLEET STREET, DUBLIN 2, Tel: 72921
Kosangas

serves all industries with best quality lowest priced bottled gas

- Kosangas service aids productivity and effects economy not only in plumbing and heating, but in numerous other industrial and domestic applications.
- Kosangas is widely known as Ireland's most versatile industrial fuel: a modern, clean-burning, fumeless gas of high calorific value, leaving no deposits.
- Kosangas service has earned a high reputation for promptness and efficiency. Skilled technicians and fitters are available.
- Kosangas Propane is supplied in 73 lb., 24 lb., and 11 lb. cylinders. Kosangas can also be delivered in bulk into customer's own storage.
- Kosangas technicians can provide guidance on any industrial fuel problem without obligation.
- Kosangas offer a HIRE SERVICE for certain equipment.

If you would like a copy of our new Leaflet of Kosangas Industrial Applications please telephone our Industrial Sales Dept:
Belfast 33221 or Dublin 74774

McMULLANS KOSANGAS (N.I.) LIMITED, 7 FOUNTAIN STREET, BELLFAST, 1 TELEPHONE: BELFAST 33221
McMULLANS KOSANGAS LIMITED, O'CONNELL BRIDGE HOUSE, DUBLIN 2. TELEPHONE: DUBLIN 74774
SEWAGE SCREENS
THAT NEED NO CLEANING
NEAR CAPE KENNEDY

This 1/2 h.p. 10 R. Comminutor, built in England by Jones & Attwood Ltd., is installed on the inlet chamber of a field erected sewage treatment plant at India Harbour Beach near Cape Kennedy, Florida, U.S.A.

JONES & ATTWOOD LTD.
STOURBRIDGE, WORCESTERSHIRE, ENGLAND

Sole Selling Agents in N. Ireland and the Republic of Eire

D. P. ENGERT & COMPANY
5 ARDEE ROAD, RATHMINES, DUBLIN 6

When you want to know all about Comminutors, please send a postcard to D.P. Engert & Company address below.
SMALL Bore Heating Systems Ltd., the servicing subsidiary of International Boilers & Radiators Ltd., have announced improvements in their "National Service Scheme for Pumps," which is operated as a service scheme outstanding in the pump it replaces, or a period of one year, whichever is increased so that each new or reconditioned pump will carry the unexpected allowance at present operating for the replacement of faulty pumps will be discontinued and each case will be dealt with separately on its merits; guarantees have now been increased so that each new or reconditioned pump will carry the unexpected portion of any guarantee outstanding on the pump it replaces, or a period of one year, whichever is longest.

This move to make International's service scheme outstanding in the country coincides with the launch of the Thermopak Al and is part of the company's general expansion programme.

Concealed fixing brackets and a new, slimmer look are two main features of the latest Stelrad radiator, made by Steel Radiators Ltd. of O.B.C., Limited of Droitwich as main distributors, have comprehensive stocks here. The new slimmer radiator is attractively finished as standard in warm white stoved primer and is wrapped in protective covering for delivery. The new radiator is available in four heights, 12", 17", 23" and 29", and from 12 to 80 sections, giving lengths from 18\(\frac{1}{2}\)" to 126". Sections now go up in multiples of four as against two previously.

The radiator will have four \(\frac{1}{4}\) tappings, except on the larger double panel radiators when the tappings will be \(\frac{1}{2}\)".

A NEW product from the Plumbing Division of The Marley Tile Company is announced for immediate availability —Marley Polythene cold water cisterns. This new cold water storage cistern is being made in three sizes, 4 gallons (actual capacity) 25 and 50 gallons (both actual). The cistern is made from black polythene and is circular in shape.

The 4 gallon topping cistern is intended for use as a central heating expansion unit. The 25 and 50 gallon cisterns are for conventional use.

The latest recruit to the increasing range of Marley plumbing products is, like all plastic products, designed to last a life time. Polythene is tough, light in weight and cannot incur rust and corrosion usually associated with cisterns of this type. Rotational moulding enables the cistern to be made in one piece with no joints or seams.

An optional extra for the Marley cistern is a circular insulating lid in expanded polystyrene.

ALLEN YGNIS Boilers Limited announce important additions to their range of recently introduced packaged hot water boilers. ADDITIONS TO BOILER RANGE

** The new Honeywell control. **

NEW from Honeywell is a completely automatic control system for all types of domestic central heating. Ideal for gas-fired, oil-fired or fan assisted solid fuel boilers, it comprises an Aquastat which is fitted in or near the boiler, and an elegantly designed low voltage room thermostat. The temperature of the boiler water is continuously adjusted by the Aquastat to ensure that it is never hotter than necessary to satisfy the demand for both domestic hot water and central heating. In summer the water is kept at a temperature just sufficient to serve domestic needs. A selection of room thermostats are available. One of these, the Day/Nite round, obviates the need for a time switch and is extremely flexible. The system can be switched off or turned to a lower setting at any time of day or night simply and quickly. The setback period can be up to ten hours.
SEWAGE DISPOSAL AND PURIFICATION

Since the last war there has grown a new awareness to the problem of sewage disposal and purification, and perhaps this has revealed itself more in rural than urban areas. Standards have been improved and public health and river authorities backed by Government legislation have been calling for improved effluents, and stricter control of pollution. Sewage authorities have been forced to add equipment to their plants, such as Micro-wire strainers to polish the final effluent, because further down the river, water is being abstracted for drinking purposes. Certain industries are being compelled to pay the local sewage authority a fee for accepting their sewage, or to install pretreatment works.

In Ireland, particularly Northern Ireland, developments in this field have brought many changes. After the war, there was a building boom, and many houses built in rural areas, were without water-borne sanitation. Now the recent distribution of piped water has opened up large areas to housing and industry. Many villages which owe their existence to port or present industries, are situated beside rivers and so adequate dilution is available for the effluent from their purification works. Yet in other areas watercourses running full in winter, dry up in summer, and farmers are becoming very sensitive about pollution and odour on their land, because Ministry of Agriculture regulations are being very stringently enforced regarding the keeping of livestock.

No longer can a septic tank become a forgotten hole in the ground, but they are now being constructed to definite sizes, needing to be regularly de-sludged. Filters with proper distributing apparatus are also a necessity and in some areas sub-soil irrigation is essential. Modern detergents also present a difficulty, because they impede the work of the anaerobic bacteria, and their presence in sullage water can become a nuisance.

Nevertheless a real effort is being made today to preserve the amenities of the rural area. Local authority officials are keeping a very close control on the siting of all new buildings. The design and construction of their disposal works are being carefully supervised.

The last few years have seen the development of a new (to this country) type of pre-packed sewage works which seems to be an answer to sewage purification and has been used in both north and south. The manufacturers claim a Royal Commission standard of effluent and this type of works is particularly applicable to areas where dilution is inadequate.

It consists of a 'horizontal flow' tank containing crude sewage, into which...
**FOR ALL CLOSED-CIRCUIT HEATING**

**NEW GECAL**

beats copper all the way

New Gecal is a special grade of cold-reduced close-grain steel tube, phosphated by a new I.C.I. process against rust and corrosion. It's as good as copper - and better. It's also cheaper. New Gecal comes in two grades - Metallized and Plastic Coated. Every single foot is water tested to a pressure of 200 p.s.i. It can be bent as easily as copper - connected with compression or capillary fittings in exactly the same way as copper. It is fully interchangeable with copper pipe, but lighter and easier to handle and transport. Supplies are assured, and prices stable. New Gecal Metallized grade is just over half the price of copper - even when copper is at its lowest price. The Plastic Coated grade is only two thirds the price of copper - and, because it needs no lagging, can make a big reduction in installation costs. In fact, installation costs can be cut by as much as 42%.

Twenty-two
MALLEABILITY PROVED BY ‘IMPOSSIBLE’ TESTS

NEW GECAL is welded in long lengths by a new process – high radio frequency welding. Because the weld is continuous, it can be bent to the maximum without leaking. Even under heavy hammering and the grossest mechanical distortion, NEW GECAL remains water-tight. When NEW GECAL is 'belled' on a press until it splits, the tear is always away from the weld. The weld is actually stronger than the tube.

EASY TO USE

NEW GECAL can be bent as easily as copper and used with any copper fitting – capillary or compression – and used in every case where copper tube would be. When NEW GECAL plastic coated is used with capillary fittings the plastic sleeve should be cut longitudinally along the tube for about 4". After jointing the sleeve can be replaced and secured by adhesive.

SAVE OVER £15 ON AN AVERAGE INSTALLATION

In a typical 3-bedroomed semi-detached house, you can save 42% of the cost of installing copper, with NEW GECAL Metallized. And 34% by using NEW GECAL Plastic Coated – which also saves the time and cost of lagging.

A rough indication of costs:

- Copper £37.9.8
- New Gecal Metallized £21.17.6
- New Gecal Plastic Coated £24.15.10

With NEW GECAL you get far more tube for your money. Buy a foot of ½” copper and then spend the same money on buying NEW GECAL – and just look at the difference in lengths! NEW GECAL ½” Metallized gives you nearly 9’ extra – 21’ in all. NEW GECAL ½” Plastic Coated – over 6’ extra (18’ in all). Savings for ½” tube are just as great. (Based on average price of ½” copper pipe between June 1964 and May 1965).

SPECIFICATIONS

**NEW GECAL METALLIZED**
NEW GECAL Metallized Grade is a steel tube, phosphated by a specially developed I.C.I. process for rust resistance, and sprayed with a metal paint to give an attractive finish. It is fully interchangeable with copper pipe and satisfies all the physical and dimensional requirements of BSS 659. Net Prices to Installer: ½” nom. bore 9jd per foot ½” nom. bore 1/4d per foot

**NEW GECAL PLASTIC COATED**
NEW GECAL Plastic Coated Grade is a rust and corrosion resistant phosphated steel tube, sheathed in an ivory coloured plastic which makes lagging unnecessary when the pipe is used beneath floors or in roof spaces. It is fully interchangeable with copper pipe and satisfies all the physical and dimensional requirements of BSS 659. No painting is necessary – although the plastic coat is an excellent base when painting is desired. Net Prices to Installer: ½” nom. bore 10jd per foot ½” nom. bore 1/2d per foot

TAKE ADVANTAGE NOW OF THIS SAMPLE OFFER

1. Please send me literature with full details of NEW GECAL
2. Please send me at a special discount a Sample Pack (200 ft – 20 ft x 10) of ONE ONLY of the following:
   - New Gecal Metallized ½” for £7 (normal price £7.18.4)
   - New Gecal Metallized ¼” for £9 (normal price £9.3.4)
   - New Gecal Plastic Coated ½” for £8 (normal price £8.1.6)
   - New Gecal Plastic Coated ¼” for £10 (normal price £10.1.8)
   - OR (400 ft, New Gecal) for £26
     - Plastic Coated ½” (normal price £26.5.4)

PUT TICKS IN THE APPROPRIATE BOXES. SEND THIS COUPON TO THE ADDRESS BELOW.

G.E.C.
THE ORIENTAL TUBE COMPANY LIMITED
(a wholly owned subsidiary of The General Electric Company Limited)
CHURCH LANE, WEST BROMWICH
STAFFORDSHIRE
Tele: West Bromwich 0044

Twenty-three
A PROBLEM often facing builders or land developers is the one of sewage treatment and disposal. To find the cheapest and best, most reliable and nuisance-free, and yet a plant which will do the job properly, is a difficulty about which there is little guidance available. The author, in making a comparison between the two basic systems available is drawing upon up-to-date technical information from the various pertinent journals, and on considerable first hand experience.

Generally speaking there are two systems of small sewage treatment plants available, namely the biological filter method and the extended aeration process. The former is well tried and established, and the latter is a development of the activated sludge treatment method, and is sometimes referred to as a 'packaged plant'.

Firstly, it must be decided to what degree of purification the liquid sewage must be treated. A lot will depend on how it is to be finally disposed of, and information should be sought on this point from the local authority concerned, or the River Authority covering the area of the proposed installation. This purity value is given in terms of residual oxygen demand (usually the five day Biochemical Oxygen Demand, BOD for short) and the quantity of suspended solids, usually abbreviated to SS. Both these values are given as parts per million (ppm).

In the U.K. the generally accepted criterion is the Royal Commission Standard, which lays down that the final effluent to be discharged shall not have a BOD in excess of 20ppm and an SS figure not in excess of 30ppm. Even compressed air is blown to oxygenate the sewage. Not only is this unit used for domestic purposes, but in industry it has recently dealt effectively with milk and fruit canning wastes. At present they are more expensive than traditional works but since their head loss is small, their use can eliminate pumping where fall is at a premium. There is, however, a considerable electrical consumption, which when capitalised adds to the cost.

In conclusion there is no doubt that more research in this field is needed, although much is being done at present. Nevertheless, if the growing problems of pollution and sewage disposal are to be overcome, government sponsorship will be necessary.

Twenty-four

SMALL SEWAGE DISPOSAL PLANTS


so, the present trend in many cases is now to specify a much better effluent, for instance as low as '10-10' is sometimes demanded where a River Authority have perhaps a small volume fishing stream into which this effluent will be discharged.

If we are thinking in terms even as generous as at R.C. Standard, it is important to obtain some form of assurance particularly from manufacturers of extended aeration plants, that under all conditions their plant will produce a satisfactory final effluent.

The biological filtration system is basically a septic tank into which the crude sewage flows. The solids and finely suspended sludges settle onto the sloping floor, the liquid weiring from the top of the tank to the revolving distributor is evenly spread onto the media surface, and in percolating through, it becomes oxidised by the live bacteria. It now flows through a small humus collecting chamber and is then often ready for final discharge to the stream or onto a grassland surface. One firm is now offering a special device to fit into the humus tank which they call a U.C.F. clarifier, and the use of this ensures a final effluent much superior to the R.C. Standard. In most cases no power is needed on these plants, because usually they can be so sited that the sewage will flow by gravitation completely through. Even where the terrain does not permit of a gravity scheme, an extremely reliable automatically controlled electric pump raises the tank effluent to the filter distributor. The pump operation is governed by the level of liquid in the pump well, consequently it only runs for a total of an hour or two each day. Being only a 3/4 HP motor, the running cost is negligible. The smallest plant manufactured is for one house (of 4 persons), and the largest generally for 140 houses.

The extended aeration plant is a factory prefabricated complete unit in a steel tank. The crude sewage on entry usually passes through an electrically driven cutting machine. A compressor supplies a continuous air bubble feed to the sewage mixing chamber, and the treated mixture weirs into an adjoining compartment where the suspended sludge settles to the bottom, and the liquid again weirs off for discharge. These plants rely on an accurate assessment of the sewage volume to be treated, and no manufacturer will offer a plant for less than 10 houses. The reason for this is to ensure some buffering of incoming sewage with a reasonable volume of partly treated material.

A criticism against these plants is their constant need for power. A good feature of the extended aeration plant is the little site work involved. Usually only a good concrete base is required, the whole plant being placed in situ in a short time.

One manufacturer of filter plants produces a superior type of distributor called the Monojet. It has been extensively tested by the Ministry of Works, who confirmed its advantages over many distributors as regards unchokeability and the little attention required. This is important because if some of the nozzles become choked, part of the filter bed is not being utilized, and the remainder is being overloaded, with a consequent deterioration in effluent quality. These Monojets enjoy an excellent reputation, and are no more expensive.

In conjunction with this review we now take a look at equipment available in this field (All claims made are those of the manufacturers).

PUBLIC Works Services (Ireland) Ltd., Merchants' Quay, Newry, Northern Ireland, act as agents in Ireland for Messrs. Eimco (G.B.) Ltd. of Gateshead, who are associated with the Eimco Corporation of the United States in the field of Aerobic Digestion Process of Sewage Purification.

The increasing costs, both capital and maintenance, of conventional sewage plants has rendered the alternative of Eimco-type packaged digestion plants particularly attractive for rural areas. These plants are now available in sizes capable of
handling from 850 to 160,000 gallons, and suitable for domestic sewage flows from communities of 24 to 4,800 persons.

All share the advantage of very small size relative to the community served and total odour-free operation. As a result, plants may be installed close to houses without detracting from amenities. Perhaps the most important advantage offered by packaged aerobic digestion plants is speed of installation. Small units can be delivered to the site, installed and commissioned in a single working day.

The plants operate as follows: In an aerobic digestion plant organic stabilisation and sludge digestion is carried out in a single unit. Incoming raw sewage is agitated and aerated by compressed air fed from diffusers at the bottom of the aeration compartment. Sewage is retained in this compartment for approximately 24 hours, at the end of which time the raw sewage has been oxidised by aerobic organisms to a stable ash, carbon dioxide and water. Treated sewage flows into the settlement compartment of the tank, where sludge settles out and a clear, biologically inert effluent is discharged. Settled sludge is of a humus-like nature, odour-free, and can be easily disposed of over agricultural land.

The only attention required by the plant is desludging at approximately four months intervals, coupled with a brief daily visit by an attendant in order to ensure that the plant is operating correctly.

Public Works Services has installed a number of these plants in Ireland to treat a comprehensive variety of wastes from Caravan Parks, Hotels and Housing Estates to wastes from Creameries.

A WIDE variety of sewage pumps is included in the very comprehensive pump range available from Sigmund Pulsometer Pumps, who have offices at Great Victoria Street, Belfast. The sewage pumps included in this range vary from massive axial and mixed flow units (8-42 inches, up to 55,000 g.p.m. and 100 ft. heads) to Package Sewage Diverters.

The Diverters are available with inflows up to 125 g.p.m. and discharge heads up to 115 ft. They have been designed to cut building costs, and are used in a wide variety of municipal developments and large and small building projects. For installation in a simple underground chamber no superstructure is required, and they are delivered as complete units for immediate installation.

The diverter is now well established, being used by public authorities, factories, schools and for sports grounds and hotels. They provide the answer to problems which frequently arise when small flows of unscreened sewage or other waste matter have to be pumped into an existing gravity sewer or sewage treatment plant.

Another 'package' plant supplied by SPP is the Water Booster unit. Capacities are up to 60 g.p.m., with larger installations also available. A simple connection to the main water supply, an electrical connection, and the unit is installed, ready to master water pressure problems in the tallest multi-storey building.

This plant caters for all water requirements and demand fluctuations, without the need for high level storage. The basic tank sizes are 250 and 450 gallons.
The storage of fuel oil explained

**FUEL** oil marketing and distribution is now big business and in addition to the major fuel oil companies, there have arisen various firms who act as agents and distributors for the foregoing major companies. The research which has gone into the handling and storage of fuel oil has been such that in the case of the latter, if the oil companies' recommendations are followed, there is no reason whatsoever for any breakdown or deterioration in quality of fuel oil when in store. In addition the development of road tankers and rail cars has now reached a point where one would be tempted to conclude that no further development was possible.

As it can be practically assumed that all fuel oil used for domestic and industrial purposes is delivered to the customer by road, let us examine first the sizes of road tankers.

The standard road vehicles vary in capacity from 2,000 to 4,000 gallons and, of course, the size of the vehicle varies as to the chassis manufacturer.

The main tank is divided into 500 gallon compartments though often in the case of the heavier fuel oils the tanker carries its total capacity of this fuel. With lighter oils, such as domestic fuel oil, loads of less than 500 gallons are quite usual.

**FILL PIPES**—Fuel oils are not subject to the same restrictions as is Petrol, due to the fact that they have flash points not less than 150°F; however many Local Authorities, in conjunction with their respective Fire Authority, have laid down certain rules regarding their storage and it is advisable that the comments of these bodies be acquired before an installation is commenced.

The size of the fill pipe is, of course, dependent on the installation and the vehicle usually carries adaptors which will fit between their hose and the fill pipe. The following materials should not be used for fill pipes, galvanised pipe, yellow brass, natural rubber or lead and zinc.

**Capacity.**—The amount of oil which should be stored relative to consumption is a subject on which there are many varied opinions as certain people are of the opinion that it should not be necessary to tie up capital in tanks and oil which is not to be used.

It is, however, recognised by most authorities that the storage should be equal to a weekly consumption plus ten days to a fortnight's oil in store. If it is necessary for this purpose to install more than one tank, each tank should be interconnected and have a common filling and discharge pipe.

In the case of the heavier fuel oils, the following table will give approximate sizes of horizontal cylindrical storage tanks.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>4' 6&quot; x 8' 3&quot;</td>
</tr>
<tr>
<td>1000</td>
<td>4' 6&quot; x 11' 0&quot;</td>
</tr>
<tr>
<td>2000</td>
<td>6' 6&quot; x 10' 10&quot;</td>
</tr>
<tr>
<td>3000</td>
<td>7' 0&quot; x 13' 9&quot;</td>
</tr>
<tr>
<td>5000</td>
<td>7' 0&quot; x 21' 11&quot;</td>
</tr>
<tr>
<td>7500</td>
<td>9' 0&quot; x 20' 3&quot;</td>
</tr>
<tr>
<td>9000</td>
<td>9' 0&quot; x 24' 1&quot;</td>
</tr>
<tr>
<td>12000</td>
<td>9' 0&quot; x 31' 9&quot;</td>
</tr>
</tbody>
</table>

For domestic use mostly rectangular tanks are used and these are sized as follows:

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Nominal Dimension: Diameter x Length.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>4' 4&quot; x 1' 6&quot;</td>
</tr>
<tr>
<td>250</td>
<td>4' 9&quot; x 3' x 3'</td>
</tr>
<tr>
<td>500</td>
<td>6' x 4' x 4' 0&quot;</td>
</tr>
</tbody>
</table>

If weight has to be taken into consideration the following table will give an indication of the approximate weight in pounds of the various fuel oils.

**Approximate Weight in Pounds:**

<table>
<thead>
<tr>
<th>Capacity:</th>
<th>Approximate Weight in Pounds:</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 60° Fahr. Heavy Medium Light Gas</td>
<td>1 Imp. Gallon 9.8 9.5 9.4 8.3</td>
</tr>
<tr>
<td>1 Cub. Foot</td>
<td>61.0 59.0 58.5 52.0</td>
</tr>
<tr>
<td>1 Cub. Yard</td>
<td>1648 1592 1581 1405</td>
</tr>
<tr>
<td>Imp. Gallons per ton</td>
<td>228 236 238 270</td>
</tr>
</tbody>
</table>

Large tanks should be installed on cradles or reinforced brick piers with a downward slope of 1/4" to the foot length away from the draw off point. The tank should not sit direct on either metal or piers but instead there should be inserted between the tank and support hardwood battens or strips of bitumised felt.

In the construction of tanks there are three provisions to be made; first, the provision of a manhole so that if at any time the tank has to be internally examined this can be done. A Sludge Cock should be provided and when the tank is in its final position this cock should be about 2' 0" from ground level. Provision should be made for the fitting of an oil level indicator and also provision for dipping the tank with a dipstick. There has been a tendency of late to exclude the last two items in the matter of economy, particularly on small installations but the writer is of the opinion that this practice is misguided.

**VENT** pipe must be fitted to all storage tanks and where possible this pipe should finish in a position whereby if the tank is being filled and there is an overflow through the vent pipe, oil will not spill over anything.

The vent pipe should be of a larger diameter than the filling pipe and it should be free from bends.

If the foregoing suggestions are carried out they should go a long way towards ensuring that the basic requirements regarding fuel oil storage have been carried out.
THERMAL Efficiency Ltd. (Northumber- 
I, Plumbing and heating, to underline 
LON, new THERMAL SPACE 
not very down to earth but it is 
HEATER, and it seems that 
11 IS 
heating temperature rise with a maximum 
air leaving temperature of 200°F. 
the unit consists of three separate 
assembly—fan chamber, heating section 
and outlet section. The fan 
chamber has two centrifugal fans of 
22" diameter providing an air volume 
of 19,000 c.f.m. at resistances of up 
to 1.75" w.g. The side panels are 
removable for maintenance access 
to the electric motors and "V" belt 
drive adjustment. The fans are 
Silent Bloc mounted. 
The heating section includes a stain-
less steel double pass combustion 
chamber with accessible heat exchange 
tubes above. The outlet section has 
six double sided adjustable outlet 
grilles to provide infinite directional 

The new Liescotherm space heaters. The 
unit is designed to provide a 90°F. 

control of the warm air from the 
heater outlet. 
The new Liescotherm Space Heater 
can be fired on 35 seconds oil, 200 
seconds oil or most forms of gas. 
Efficiencies of 80 per cent. are nor-
mally attained and a fuel consumption 
of 11.8 gallons per hour at maximum 
demand can be expected. 
* * * 
TWO NEW polypropylene fittings have 
been introduced by The Key Engineer-
ing Co. Ltd. (Lark-
field, Kent). They 
are the 104 degree 
4-inch branch junction and the 4-inch 
x 95 degree, 9-inch mean radius bend. 
The new fittings extended the com-
pany’s range of precision injection 
moulded fittings for pitch fibre pipe 
drainage systems. They combine great 
structural strength with resilience, will 
accept discharges at 100 deg. C and are 
virtually chemically inert. They are 
removable from all Key stockists and 
delivery is ex-stock. 
* * * 
VAN den Bosch Ltd. (of Europair 

TALKING SHOP 

from page twelve. 

practice it is a very good idea to be 
able to live in all the house at once. 
If you live in one room then there 
is a constant clash between T.V. and 
homework. The pained expression on 
the children’s faces when some guest 
enters and sheer good manners means 
that “box” must be turned off; and 
even the fact that you are paying rent 
or mortgage on a 1,000 sq. ft. of floor 
and living in about 20 sq. ft. of 
floor space can become very irksome. 
All this may sound a bit impractical 
and not very down to earth but it is 
an established fact that once anyone 
has lived in a decently heated home 
they will not live in any other way. 

Of course it should not be necessary 
in a journal like this, which is devoted 
to plumbing and heating, to underline 
the importance of the job we do, but 

Am I not only to see what the job is 
really about. There is a story which 
may illustrate my point; it seems that 
way back in history when a cathedral 
was being built, a celebrated architect 
walked round the site taking to stone 
masons who were working away with 
mallets and chisels dressing stone. 
When the first man was asked what 
he was doing he looked around with a 
pained expression and said: “Well you 
can see what I am doing. I am 
dressing a stone”. The second man was 
a bit more forthcoming; he knew where 
the particular stone he was dressing 
was going and was able to say: The 
third man, no doubt the happiest one 
of the lot, simply said: “I am building 
a beautiful cathedral”. 

Talking of architects, whose “image” 
in our trade could perhaps be improved 
at times, there is a story of Sir 
Christopher Wren that happens to be 
quite true and bears repeating. In 
seems that he was called upon to build 
a Guild Hall in a certain town West 
of London and when he submitted his 
designs the Mayor and Corporation 
noticed that there was an extremely 
long span of roof over the main 
chamber. Wren, of course, knew 
what exactly he was doing but the 
powers that be, who, after all, were 
finding the money, were quite sure that 
this arrangement would collapse in 
time and that a neat row of supporting 

pillars down the middle were essential. 
Of course they had their own way and 
the pillars were duly built. It was not 
until this century that it was discovered 
that all of the pillars ended a fraction 
of an inch short of the ceiling they 
were supposed to support!

I DO not know what the equivalent 
of that sort of action would be in 
modern heating practice. Generally one 
finds that adequate support is one of 
the things that gets pretty badly 
overlooked at times. Not long ago I 
remember a heating installer complain-
ing bitterly because he was asked to 
refix a radiator after a child had been 
swinging on it. This comes right back 
to my earlier point about a heating 
system being a collection of machinery 
to be used in a home. Where there is 
a home there is usually children, and 
children will swing on radiators, doors, 
gates or anything else that provides 
support. In fact in my own home I 
have to be pretty careful about the 
way I fix the curtains. One of the few 
arguments I can think of in favour of 
the use of black iron rather than 
copper for small domestic systems is 
that it makes a rather stronger climbing 
frame. Cheerio until next month.

Twenty-seven
The Irish Plumbing and Heating Engineer.

GAS OR ELECTRIC?
WELDING OF COURSE!
But we also have a wide range of cutting and heating equipment, accessories and safety equipment. Delivery services everywhere.

CONTACT INDUSTRIAL GASES (I.F.S.) LTD., DUBLIN

INDEX TO ADVERTISERS

A NEW 500,000 Btu's OIL FIRED AIR HEATER

- 500,000 B.t.u./hr.
- Over 82% efficiency.
- Outlet head included for vertical free-standing models.
- Horizontal or vertical models.
- Ducted models available.
- New high efficiency combustion head gives permanently clean flame.
- Nozzle and flame position visible during operation—simple to adjust.
- Photo-electric burner control.
- Complete range of oil heaters now. HO/VO 100, 200, 300, 500, CO 600, 800 1000.

Other products include Gas Fired Air Heaters (Vertical Horizontal); Gas Radiant Heaters, Gas Fired Convector Heater, Electrostatic Air Cleaning Equipment and Mechanical Dust Collectors.

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KILLOWEN STREET, COLERAINE, NORTHERN IRELAND
Telephone COLERAINE 2315

20th-eight
There's only one way to improve on central heating by Thermalrad Radiators...fit them with Ranco Thermostatic Valves. Together they give unparalleled control of room warmth with unbeatable savings on fuel. Here's how!

Thermalrad Radiators heat like radiators twice their size. And because of their compact efficiency they do it much, much faster. One saving on fuel bills!

Ranco Valves regulate individual room temperatures over an adjustable range of 30°F. Warmth and comfort are kept just right...automatically guarded against any overheating. Another saving on fuel bills! Add together the fuel savings with Thermalrads plus the savings with Ranco Valves — unbeatable economy! Nicest warm rooms too. Perfect for your clients.

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Thermal Radiators Limited • Falcon House • Woodley Reading • Berks • Telephone: Sonning 2981

IRISH REPRESENTATIVES:
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G. W. Monson & Sons (G. W. Monson Esq.) 227 Beersbridge Road • Belfast 5 • N. Ireland

---

An edge filter for all chemical fluids. The filter element consists of a stack of discs keyed to a centre spindle and separated by spacers. The narrow slots thus produced can be varied at manufacture from .0015 in. (.040 mm). Further sizes range from 1/2" b.s.p. to large standard flanged connections. Cleaning is carried out without interruption of flow by one complete turn of a handle on top of the filter.

The filter element—an accurately spaced wire helix wound on to a precision machined former—can be varied at manufacture to give interstices between .003 in. and .010 in. (.076 and .203 mm). Capacities range from 14,000 to 260,000 g.p.h. Back flush cleaning is carried out entirely automatically without interruption of flow. A secondary Microdisc filter can be fitted, if required, for recovery of the liquid used for back flushing.
THE Wanson Company Ltd., (Borehamwood, Herts) have long been established as manufacturers of Thermobloc air heaters.

**Thermobloc HOT WATER BOILER**

It is of interest, therefore, to announce a further expansion in their range of products with the Thermobloc hot water boiler.

This unit has been highly developed over many years and is widely used in Europe. Designed specifically for industrial central heating systems, it can equally well be used for supplying hot water in factories, canteens, cloakrooms, or for any installation requiring a constant supply of hot water.

Four basic sizes are available:

- **GR.40**, 120,000 to 200,000 B.t.u./h.
- **GR.60**, 200,000 to 280,000 B.t.u./h.
- **GR.80**, 280,000 to 360,000 B.t.u./h.
- **GR.125**, rated at 500,000 B.t.u./h.

Overall height of the smallest model is 49 in. and 78 in. for the largest model, so it can be seen that these boilers are very compact for their rating.

Based on a vertical smoke tube design, the Thermobloc Water Boiler has a refractory lined combustion chamber.

**A COMPLETE range of compact air-conditioning units designed for application either singly or in batches to all types of buildings where there are heating and cooling requirements, are now available from the Searle Manufacturing Company Limited, of Fareham, Hants. The units, called Comfort Conditioners (CC Units), are manufactured in six models with an overlapping range of air deliveries from 600 cfm. to 4,800 cfm. Each heater battery and/or cooling coil, a filter section with cleanable or throw-away type filters is fitted.**

*Thirty*
'UNIVEX' PACKAGE BOILER

Steam or Hot Water

- "Packaged" Unit. Simplified installation.
- Automatic Safety Equipment.
- Efficiency up to 90% obtained.
- Minimum operating attention.
- Simplified Boiler maintenance.
- Burns 200 secs. oil without pre-heating.
- Flanged steel fittings.

Service — Factory trained personnel for service.

- Over 40 installations operating satisfactorily in this country.

GOLDEN VALE ENGINEERING DEPT.,
Charleville, Co. Cork. Telephone 255

Ideally suited for Central Heating Installations.

WHO KNOWS? We don't, and frankly we haven't much time to think about it. Here at Davidson's we're much more concerned with other problems — moving air and other gases, for example. For over 80 years we have been thinking about the problems involved and solving them by designing and making fans and ancillary equipment exactly fitted to requirements. Whether it's heating and ventilating, air conditioning, fume or vapour removal, dust collection, air preheating or the pneumatic conveying of bulk material, Davidson's have the right equipment for the job. You'll find our products in thousands of British factories, in many British coal mines, in most British power stations, and in industrial establishments throughout the world. Our extensive range of technical literature is freely available on request.

Sirocco Engineering Works,
Belfast, Northern Ireland
(Telephone Belfast 37251)

LONDON BRANCH: Morris House,
Jermyn Street, London, S.W.1
(Telephone Whitehall 3541)

ALSO AT MANCHESTER - GLASGOW
BIRMINGHAM - NEWCASTLE-ON-TYNE - LEEDS - CARDIFF

Thirty-one
Most Growers who choose Allied boilers like their economic running costs, the vast 46-boiler selection, and the service and application advice that come with them.

Kenilworth Vineries, large tomato growers, in conjunction with Leale Ltd., leading heating engineers, had a rather more special need. They wanted to combine a standard 2-boiler low pressure hot water system with the facility to raise steam for soil sterilisation... the latter for a short period annually.

Allied solution: a simple modification on the two new Class 1 boilers that, with a minimum of make-ready, delivers exactly the right amount of live steam when needed. The result has been a considerable saving in heating costs.

Call in Allied yourself, if you’re considering new boilers for your glasshouses. This kind of special help comes as a matter of course—and with it the best possible heating installation for your specific need.

INDUSTRIAL BOILERS MADE BY
ALLIED IRONFOUNDERS

Allied Ironfounders Ltd. Industrial Heating Division,
Sunbury-on-Thames, Middlesex Tel: Sunbury 5577
New heating techniques were predicted ... but

During the past ten years there has been many predictions concerning new heating techniques. We have been told that there are new revolutionary units on the market, such as boilers, atomic and solar.

In fact only a few minor changes have occurred on the heating front. Most of the later developments have been limited to improving liquid fuel installations and increasing their efficiency. There are some minor developments as well in improving solid fuel installations. Better control systems, better safety systems and better efficiency have been provided.

With the expansion of the heating industry the range and types of equipment is becoming increasingly large and complex. In addition, with the increase in size and complexity of engineering services installation in industrial buildings, increasing attention is being paid to the performance of such plant in service to see whether or not it lives up to the manufacturer's claims.

So the purchaser or engineer or specifier is sometimes at a loss when faced with the selection of the most appropriate equipment. The information offered him at times may not always be as clear as he would have liked it to be. On the other hand, if the purchaser or specifier is not conversant with new makes and he is forced through economy to install a new unit, he has only to wait the results from the operation of the plant.

Generally manufacturers do not try to deceive their clients, but information on the true performance of plant and equipment is sometimes lacking often because the manufacturer himself has not the real data—or at least has not the data to present on a comparable basis with similar equipment of another make.

So this point bears out the importance of test codes and test facilities. In the domestic field the solid fuel gas and electricity industries have established very good facilities for both testing and approving equipment. When it comes to industrial equipment, such as large boilers, the initial capital and outlay for such testing and approving facilities is very vast. At the present time very few independent test facilities exist. It may be of interest to our readers to point out that British standards test codes are not available for all types of equipment. Though, just over two years ago the Heating and Ventilating Research Association in conjunction with the Cast Iron Boiler and Radiator Manufacturers' Association made a start by setting up a test room, primarily for testing radiators and connections.

The purchaser or specifier is faced with a very heavy decision to select his boiler plant and designing an arrangement which will function properly and efficiently, provide convenience from an operating view point and fit in as a co-ordinated part of the plant. The over expanding industrial and institutional requirements for heat are providing a growing demand for low and medium pressure processes and space heating steam that can be more economically and efficiently satisfied by a packaged automatic boiler.

The modern packaged boiler is designed specifically to satisfy industrial requirements, for a compact, efficient safe and fully automatic unit that can be installed in a relatively small area. The packaged boiler which is today the standard unit in industrial and commercial buildings is a complete self-contained boiler burner unit. The unit is completely factory assembled and fine tested. It is ready to generate steam or hot water after its fuel supply, electrical supply, steam lines, condensate return lines, feed lines, blow down lines and flue gas outlet have been connected. The reason for specifying packaged units today, even for domestic purposes, is that the overall cost is much cheaper and the purchaser has a better unit which has been factory tested. Further more the packaged unit takes up less space, is more compact and neat in appearance. In this modern age of 'packaged goods' the packaged boiler burner unit has been given a very prominent place.

Selection of equipment: (a) The selection of boiler is generally easy to decide, despite what has been said above. What the purchaser is really concerned with is trouble free operation. It is only to be expected to have minor breakdowns, stoppages, etc. So a deciding factor in the selection of equipment is after sales spares and service. This is the most important factor to be kept in mind, for if the unit breaks down in a busy industry, where production ceases due to loss of steam, (e.g. glass house heating, a whole crop may be lost due to heavy frost; bottling plants, loss of steam prevents bottling, etc.), great losses may be encountered. Basically there is very little difference in packaged boilers of the same design. Controls, burners, size, weight, etc. differ whether wet back or dry back; (b) Select a boiler-burner unit that has proved itself over the years both in operation and efficiency. Select a boiler most suitable for the application.

Types: Heating boilers are classified

Continued page thirty-five

Thirty-three
What's so special about the Chieftain?

Plenty. It is, for instance, exceptionally quiet in operation, cool running and most economical in floor space. It ranks as an outstanding 3-pass, oil-fired boiler. It is fully automatic with optional superheaters. It offers excellent internal accessibility. And that's not all. Dominating other important advantages is its performance—rated at 85% gross c.v. efficiency. Small wonder, then, that demand runs high for the Chieftain—the finest boiler of its type available in Europe today. Write now for details to Cochran & Co. Annan Limited, Annan, Dumfriesshire, Scotland. Agents: S. W. Carty & Son, 12 Lower Mount Street, Dublin 2. Southern Engineering Co. Ltd., Parnall Place, Cork. W. H. Scott & Son, Ann Street, Belfast.
in a number of different ways, such as:
(1) according to materials or construction these are steel or cast iron,
(2) according to the fuel for which the boilers are designed. These are coal-fired, hand-fired or stoker fed, oil or gas fires,
(3) according to the specific purpose or application for which the boiler is used e.g. space heating or domestic hot water supply,
(4) according to the design of the boiler, such as sectional round, fire tube, water tube, etc. The other technical factors to be considered by the specifier are:
(a) the maximum load or gross load, on the boiler,
(b) design load—i.e. radiation load, the estimated heat emission in B.T.U. per hour of the connected radiation (direct or indirect or forced convection coils) to be installed, hot water supply and piping tax, i.e. heat losses, etc.
(c) the efficiency of coal, peat, gas or oil,
(d) grate area with hand fire boilers or fuel burning grate with stokers or oil or gas,
(e) combustion space, in the furnace,

HEAVY DECISION IN MAKING PLANT SELECTION

(f) type heat liberation, whether continuous or intermittent or a combination of both,
(g) convenience in firing, cleaning or maintenance,
(h) adaptability to changes in fuel, e.g. oil fired boilers can use either 200, 950, 3,500 sec. oil with only minor adjustments such as oil temperature and pressure,
(i) height of water line,
(j) draft control or special flues required, head room required, front and back room required for servicing, and maintenance.

Water heaters: Two systems are generally in use for the supply of domestic hot water. Direct: A boiler specially designed for water heating is usually treated internally to prevent discolouration or becoming contaminated. Such boilers are treated, and are lined for this purpose, e.g. Bower-Barfield. In this case the boiler is the medium for heating the water directly and a flow and return pipe is connected to the storage vessel. If a central heating boiler is used for the purposes of heating and domestic hot water supply, whether it be a steam boiler or hot water boiler, the Indirect system must be used to supply hot water, i.e. a Calorifier or indirect cylinder.

Heat exchangers: The principles of heat recovery in a wider sense may be called the principles of fuel economy. Heat not usefully employed for its original purpose can be recovered in many ways, e.g. (a) heat in flue gases from boilers, etc. and furnaces; (b) heat in warm air from driers; (c) calorifiers etc. may be classed also as heat exchangers.

Heat exchangers transfer the heat from the hot liquid or gases to the cold medium. Just as in man the lungs and stomach are used to transfer the energy

Continued overleaf
In this equipment review we take a long look at new developments in the fields covered by this special review. (All claims are those of the manufacturers).

from previous page

to the blood, the heat exchanger is used to transfer the heat to another energy.

A typical example will illustrate our point quite clearly. 'Green's Fuel Economiser'. In steam boiler plants the escape up the chimney of high temperature flue gases is often a source of waste energy that may be considerably reduced by the installation of an economiser or heat exchanger, the function of which is to abstract heat from the waste gases and impart it to the boiler feed water before it is delivered to the boiler. By this means the evaporation of the plant for a given oil or peat consumption is increased or in other words it obtained by less fuel. Furthermore less chemicals are required for treatment of the water to prevent scale and corrosion inside the boiler, thus resulting in more savings and better economy.

IDEAL-STANDARD, the Hull manufacturers of central heating and bathroom equipment, have announced a new addition to their industrial boiler range which the company is launching this month. The new product is the No. 4 Vanguard oil-fired cast-iron boiler.

Available in seven sizes, from 390,000 Btu/h to 750,000 Btu/h, the No. 4 series is to be supplied with pre-wired, pre-set pressure jet burners to simplify installation and at the same time to give a high standard of combustion. In this regard, tests have shown that the overall thermal efficiency is in excess of 80 per cent.

In addition, a restyling of section design has been incorporated to improve both ease of assembly and of maintenance. The list prices in Britain for the range are between £420 and £666. With the pre-set air-fuel ratio the combustion air control is set to give the correct air delivery according to the size of the boiler. Similarly, the oil nozzle is selected and fitted at the factory and pump pressure is set to provide the appropriate oil delivery.

A combined relief door and draught stabiliser is incorporated in the smoke hood, which is designed to give top or back outlet. Commenting on these features, Mr. R. H. Doyle, general manager, Sales, at Ideal-Standard, said: "These design elements are to ensure a really high standard of performance and a minimum of site adjustment, so that we are virtually offering the heating engineer a packaged deal to save time and money."

Camron or Selectos burners can be supplied with the new No. 4 Vanguard.

* * *

THE Allied Ironfounders Steam Boiler type NSB.25 from the company's comprehensive industrial range is a high pressure (150lbs. per sq. in. design) steam boiler rated at 2,500lbs. per hour evaporation from and at 212° F.

The Allied packaged boiler is a horizontal three-pass semi-wet back smoketube unit of welded construction designed to give long trouble-free service. The semi-wet back design eliminates the need for refractory arches and a rear combustion chamber water wall with its consequent restricted access.

The refractory lined combustion chamber

Continued page thirty-nine
oil-fired boilers
installed for long life, reliability & efficiency

A Harper Meehanite 300,000 Oil-fired boiler is now heating Ballygowran House, Maynooth, Co. Kildare.

This installation is one more illustration of the growing popularity of Harper Meehanite Boilers with heating engineers all over Europe. To the many advantages of Harper Meehanite boilers the following are now added.

1. Every section is guaranteed for five years.
2. A nationwide sales and advisory service is in operation.
3. Boilers available for quick delivery.

DELTA WATER FITTINGS LTD.
for the world of today

The hand of an artist
designed this tap ... but
the hand of an engineer
made it.

It is one of the many DELTA
designs ... elegant or workaday
as the purpose dictates ... to
be found in
modern bathrooms everywhere.

DELTA WATER FITTINGS LTD.
WATER FITTINGS SECTION
SHOWELL ROAD WORKS
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Tel: HOP 0131. Telex: 94797
PRODUCT REVIEW

from page thirty-six

within a rectangular casing which is another special feature of this range. In addition to improving the appearance, the casing also provides ducting for combustion air which becomes preheated by the heat usually lost from a boiler's exposed surfaces. In this way, the boiler shows a two per cent. gain in efficiency at full load, and very much more at part load.

Cochran and Co. are represented in the Republic of Ireland by S. W. Carty and Son, 12 Lower Mount St., Dublin, and the Southern Engineering Co., Parnell Place, Cork, and in Northern Ireland by W. H. Scott & Sons, 93 Anne Street, Belfast.

THE LATEST development from the Marshall and Anderson organisation (Manse Road, Motherwell, Lanarkshire) is their Compak packaged boilerhouse, which has been developed to fire turf and is known as the Turfpak. Details of this unit are not being released at present by the company.

The Compak is a fully integrated portable unit, including the boiler complete with safety and operating ancillary equipment. Coloured in attractive shades with side walls in profiled aluminium or protective coated steel casing, as required, it is installed with ease on a site that requires the minimum of preparation, and because no site assembly is necessary it is ready for immediate operation as soon as the service connections are completed.

The boiler is of the multi-pass, wet back, horizontal economic type, complete with withdrawable fully corrugated furnace, and has a wholly immersed wet back combustion chamber.

For the firing equipment, various degrees of automatic equipment in accordance with prevailing conditions and requirements are available to suit the following fuels—oil, gas, C.T.F. and coal.

TRANE LTD. (Dunfermline, Fife, Scotland) have a new Torrington line— for heating and ventilating large areas such as school auditoriums, gymnasiums, commercial and industrial buildings. It now includes 102 standard units. Extension of the Torrington line, to 17 basic sizes with heating capacities from 20,000 to 3,800,000 Btu/h and air capacities from 600 to 54,000 cfm., has made it the largest line of its kind in the industry, the manufacturers claim.

Six models—horizontal ceiling, horizontal floor, vertical floor, vertical wall, inverted ceiling and inverted wall—allow the Torrivent to be adapted to a greater number of installation sites throughout the building. Sectional construction makes possible a step-by-step selection of procedure of casing and fan section; steam or hot water coils; and accessories.

The new Trane Model S horizontal unit heater is a highly efficient and attractively styled hot water or steam unit that incorporates Trane's exclusive Sigma-Flo fin configuration on its heat transfer coil. The unique one row single tube serpentine heating coil with oversized 1" tubes and the high performance Sigma-Flo fins result in extraordinary performance for such a compact unit.

MARSHALL Sons and Co. Ltd. (Gainsborough, Lincs.) manufacture a range of automatic fire-tube boilers with ratings from 520 to 32,500 lb. steam/hour and equivalent Btu outputs (from and at 212 degrees F.). The CB range of boilers are four pass horizontal fire tube units with a single furnace flue at the bottom of the boiler forming the first pass, and the other three passes above and at the side of the flue. A reduction in the cross sectional area of each pass maintains a high flue gas velocity, which promotes optimum heat transfer and minimises soot deposits.

A forced draught design eliminates the necessity for tall expensive chimneys.

Continued page forty-one

Thirty-nine
Featured on this page are some of the Trane Products manufactured in Scotland. For details on the complete range of Trane heating, Air Conditioning and Refrigeration equipment, contact your local office whose address is listed below.

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Eire.
Telephone: Dublin 63470.

P. & D. Macfarlane Ltd.,
53 Ridgway Street, BELFAST, 9,
Northern Ireland.
Telephone: Belfast 667968.

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neous, and a low noise level is maintained by the caseless fan and air compressor operating from the same motor. Both front and rear doors are either hinged or davited to swing open, exposing tubes and fire-side surfaces. Under normal operating conditions fire-tubes only require cleaning once a year. The controls are contained in a dust-proof cabinet, and fully automatic safety controls—including electronic flame scanner—ensure complete protection under all operating conditions.

The Marshall M type boilers are similar in design to the CB range and have ratings from 520 to 1,380 lb. steam/hour, whilst the P type is the hot water equivalent, with outputs from 500,000 to 1,340,000 Btu/h. With the problems of frequent high temperatures in mind, extensive research was carried out on the flow and return connections of Marshall’s hot water CB and P type boilers. Tests proved that the most favourable conditions occurred with the hot water outlet situated on top of the boiler near the rear, with the return water inlet located in front of the outlet.

The return water connection is fitted with a specially designed inlet nozzle which increases the return velocity and provides rapid and complete mixing with the hottest water on top of the boiler. The return water is therefore tempered before it comes into contact with the heating surfaces. The high velocity flow is in the same direction and pattern as the normal thermal circulation within the boiler and this arrangement keeps temperature gradients to a minimum, reduces stress and completely eliminates thermal shock.

Marshalls are represented in the Republic of Ireland by Thermal (Ireland) Ltd., 85 Lower Baggot St., Dublin, 2, and in Northern Ireland by Samuel Stewart (Thermal Engineering) Ltd., 26 Neill’s Hill Park, Belfast, 5.

* * *

Davey, Paxman and Co. Ltd. recently introduced their successful Autonomic boiler range at receptions in Dublin and Belfast (IPHE, July). Since our review of the range last month we learn that upper range of the heaters has been extended from 5,000,000 to 6,000,000 Btu/h.

* * *

Bastian and Allen high voltage electrode boilers are designed for the supply of central heating with or without thermal storage, and for large hot water supply systems and industrial processes where heated water is required. They offer efficiency up to 98 per cent., rapid response in heating up, take less space than the conventional solid fuel or oil fired boilers, fuel stores, chimneys or flue are not required, and they involve no smoke, no ash, or dust. They are fully automatic.

The major advantage of the B and A design of high tension electrode hot water boiler control is that it may operate on widely varying waters, although some treatment may be required to ensure the optimum operating conditions. Boilers are operating with water conductivity between 100 and 1,200 micro-mhos per centimetre cube at 20 degrees C., but to ensure that possible water treatment is considered at an early stage, it is important that analysis be made of the water to be supplied to the system.

The electrodes are carried by bushing insulators which pass through and are supported at the top of the boiler. The electrodes are located within, or partially within, the jet tube insulators, and load insulators provide load adjustment when moved up or down. When in the fully lowered position, minimum load is obtained.

PRODUCT REVIEW
from page thirty-nine

DRAUGHT AND FLUE TROUBLE?

These are non-existant with the installation of a NORAH UEG boiler. Induced draught fan built into the back section encased in a water-cooled jacket. Designed and developed by the one manufacturer, no improvisation but a perfectly balanced unit. Boilers obtainable with top-mounted and front-mounted burners, under-feed stokers, dual purpose, etc. A versatile boiler in capacities up to 10,000,000 BTU's/hr.

How the UEG works

SECONDARY RADIATION PLATES

WATER WAYS

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Front mounted burner, standard convection sections, normal efficiency boiler.

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How two Multipacs saved over £9,800 in nine months.

...for the Walsden Bleaching & Dyeing Co. Ltd.

Since June 1963 when two 10,500 lb/hr Multipacs replaced Lancashire boilers in the Walsden Bleaching & Dyeing Co. Ltd's mill at Todmorden fuel costs have been cut by 38.4% and supervision and maintenance time have been greatly reduced. Total economies including fuel saving, labour charges and increased steam raising efficiency amount to £9,856. Early evidence that substantial savings were being made prompted the company to order a third Multipac, 16,500 lb/hr, for their nearby Jubilee Mill. These Multipacs are now supplying the flexible but 100% reliable steam that is vital for textile finishing processes, just as Multipacs are supplying the steam requirements of refineries, chemical works, breweries and all kinds of industry the world over.

The Multipac is a completely packaged, fully automatic oil-fired wet-back boiler available in sizes from 2,000 to 50,000 lb/hr. Every boiler is steam tested before despatch and is backed by the nation-wide Multipac Maintenance Service. Want to know more about Britain's best selling package boiler? Just write

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as the current path is of maximum resistance, and vice versa.

The boilers require a minimum size of shell for the electrical path through the water and therefore the smallest practicable boiler shell is for loads up to 2,000 Kw. It is rated for 1,000 to 2,000 Kw., as the controls can be set for any maximum load between these figures. In special cases the maximum load can be reduced still further, but usually for such loads a transformer and a B. and A. medium voltage electrode hot water boiler makes a better installation.

Bastian and Allen Ltd.—a member of the Parkinson Cowan Group—are at Ferndale Terrace, Harrow, Middlesex.

* * *

A COMPREHENSIVE range of cast-iron sectional boilers is available from Hartley & Sugden Ltd. (Halifax) and these include the White Rose series A1 and B2 for water. The A1 series can be supplied up to 16 sections —1,440,000 Btu/h— for oil fuel or mechanical stoking. The standard unit includes six 4-in. pipe connections up to 609 and eight 4-in. 610 to 613. Connections up to and including 5" diameter can be supplied. Flows can be fitted on any section except front and back, and returns on any section except back. The series B2 can be supplied up to 14 sections (960,000 Btu/h) for oil fuel or mechanical stoking.

Also from the range of Hartley and Sugden is the new Colifax steel fire tube boiler with a high thermal efficiency and conservatively rated. Designed to take advantage of the growing use of coal in effective and economical installations, they are eminently suitable for matched use with leading makes of automatic underfeed coal stokers or suitable chain grate stokers. Flexible construction methods enable the larger sizes to be provided with openings for various means of ash removal.

The Oilex boiler—also from Hartley and Sugden—has undergone important design changes, as a result of recent developments and advances in combustion engineering. Foremost among these is a radical re-appraisal of the mass flow rates of flue gases through the fire tubes. The result has been an enhanced ability to take advantage of modern combustion techniques, compact design and high efficiency.

The series 9 Oilex can be fired by any high quality oil burner unit and is inherently capable of utilising the burner to its highest potential combustion efficiency. Most installations are commissioned at 83 per cent.

Scale? Corrosion?

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in brief...

RADIATION Gas Fires Limited, Radiation House, Nth. Circular Road, London, N.W.10, manufacturers of "Satellite" overhead radiant gas heaters, have recently issued booklet form a paper given to Industrial Engineers of the South Western Gas Board earlier this year by Mr. H. Watts, M.Inst. Gas.E., Development Manager of Radiation Gas Fires Limited. The paper deals with the issues to be considered in calculating the heating required for various buildings, and the methods by which this can be done.

A NEW addition to the Keith Blackman Ltd. range of air filters for heating, ventilating and air conditioning purposes is the Conominor. It is on a smaller scale than, and is supplementary to, the Conomat-X type introduced last year and is suited to both horizontal and vertical mounting. Offering low cost filtration for capacities from 2,000 to 7,200 cubic feet/minute the Conominor employs a new long-life filter medium.

Van den Bosch Ltd. (Europair House, Alexandra Road, Wimbledon, S.W.19) have introduced the Tuttle and Bailey Type P3 Adjustable Pattern Ceiling Diffuser. The Type P3 is a three-cone circular diffuser in which the air distribution pattern may be varied from horizontal to vertical and once set, systematic pressure or vibration will not affect the setting. There is a minimum amount of effective area change when the air pattern is regulated.

* * *

UNDER the headings "Refractories" and "Refractory linings" on Page 68 of our June 1965 Directory issue we inadvertently quoted the agents in the Republic of Ireland for A. P. Green Refractories Ltd. as Mr. S. Murphy, We now understand that the agents for the Republic are Messrs. Brooks, Thomas and Co. Ltd., 4 Sackville Place, Dublin 1.

PLUMBING

from page five.

5. Connect the hoses to the blowpipe. Again remember, maroon to acetylene and black to oxygen. It is a good plan to blow air (not oxygen) through hoses before coupling them up. This ensures that they are clear of dirt which could clog the narrow gas passages in the blowpipe.

6. Choose the size of blowpipe nozzle suited to the job and your style of leadburning, and fit it to the blowpipe outlet. The nozzle size will vary according to the thickness of lead to be joined and the type of joint to be made. For example, a number 4 nozzle might be used for flat-butt leadburning on 6 lb. lead sheet, whereas for a thinner sheet a number 2 or 3 might be adequate. For upright leadburning joints on 5 lb. lead a number 3 nozzle will generally do very well, although a slower leadburner might prefer the smaller flame of a number 2. You will see therefore that there is no hard-and-fast rule about nozzle sizes for any given job. As a general rule, it is better to use the hottest flame that you can control.

TURNING ON THE GASES

When your equipment is set up, it should look something like that in Fig. 1 (but without the trolley perhaps), and you will be able to turn on the gases.

1. Insert the cylinder valve key into one of the cylinders and gently open the valve. Do not open it suddenly, since this would impose a shock on the pressure regulator and gauges which might damage them. Gauge glasses have been known to shatter and seriously injure the operator because of this. Modern oxy-acetylene gauges are fitted with thin, pliable brass backs so that if the gauge bursts, the back will blow open and relieve the pressure. This device is shown in Fig. 1. It protects the operator—but you still have to be careful about opening the cylinder.

2. Open the valve until the valve spindle has made one complete turn. The high-pressure gauge on the regulator will now register the pressure of gas in the cylinder. If there is no obvious leak—which you could detect because it makes a hissing sound and, in the case of acetylene, a distinctive smell—open the valve of the other cylinder in the same way.

3. When both valves are open, the pressure regulators have to be adjusted so that the right amount of low-pressure gas is admitted into the hoses. This is done by turning the capstan-headed regulating screw clockwise, so that it pushes against the spring-loaded diaphragm and moves the high-pressure valve off its seating as shown in Fig. 2. The low-pressure or hoseline gauge will now register the pressure passing to the blowpipe. For leadburning this should be about 2 lb./sq. in. on both acetylene and oxygen hoses.

4. You must now check that the equipment is gas-tight. Never use a naked flame for this since, you will remember, acetylene gas is highly inflammable. The test can be made with a soap solution, which you should always have handy. If you apply soap solution round every joint with a clean paint brush, any leaking gas will show itself by blowing bubbles through the soapy water (This is shown, together with other useful ideas, in Fig. 1).

LIGHTING THE BLOWLAMP

When you have made sure that all is in order: that there are no leaks in the equipment, and that there is no risk of the blowpipe accidentally setting nearby materials on fire—you can proceed to light up and begin the important business of adjusting the flame.

One method of doing this is first to open both the oxygen and the acetylene pressure regulators until just enough gas can pass through to ignite at the blowpipe tip when its control valves are fully open. After this you can adjust the flame by manipulating the regulators almost as if they were the blowpipe control valves. The advantage of the method is that when you have finished with the blowpipe and shut it off by closing its control valves, you can quickly bring back the correct flame simply by turn the blowpipe valves full on again.

This method, however, is only satisfactory where a single blowpipe is being fed from the equipment. If several blowpipes are being supplied, then the gas flow would fluctuate seriously as the various operators opened and closed their individual blowpipe controls. As a rule, then, it is better to adjust the regulators to pass low-pressure gases at about 2 lb./sq. in. and then to make local adjustments of the flame by manipulating the blowpipe controls. To do this you would first open the acetylene control to pass fuel gas to the blowpipe tip where it can be ignited, preferably by a spark gun.

(To be continued)
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