

paper on the first Wednesday of the following month. It is even more essential that an annual report should be sent to all donors to enable them to see for themselves, if they so care, that their donations are included in the lists published therein. The actual final accounts are built up from these lists, and here I would remark that nothing appears more unbusinesslike than the lazy habit some hospitals have of not totalling in their report their various lists of annual subscriptions, donations, etc. Untotalled lists of acknowledgments prove nothing to the subscriber—they must be totalled and shown to agree with the totals appearing in the income and expenditure account.

In concluding my remarks on the receipt of cash, may I say that the secretary should personally check the cashier's cash occasionally. And when doing so he should see that the balances of all accounts are ascertained, added up, and then the total cash agreed. Checking accounts separately allows for substitution of cash. Finally, I advise strongly that a complete check should be kept of all receipt books issued. This guards

against these books finding their way into unauthorised hands; but, in addition, if the list is checked at the year end and all books shown to have been issued are produced for audit, it will prevent their unauthorised use in authorised hands.

The above are some of the precautions which can be taken in the receipt of the more principal items of cash. I appreciate that payment of accounts also lends considerable scope for fraud—perhaps the most common being collusion between a clerk and tradesman on the amount to be invoiced. But precautions for tradesmen's accounts, payment of wages, superannuation accounts, etc., would take me far into another paper. This article has been written with some small hope that it will at least cause secretaries to pause and review the systems of their own hospitals. I have actually experienced the immeasurable harm which falsification can do, not only to the particular hospital concerned, but to the whole voluntary hospital movement, and we cannot but agree that the publicity which is then so freely given is very much of the wrong kind.

CENTRALISATION OF BOILER PLANT FOR THE CENTRAL HEATING, HOT WATER SUPPLY, LAUNDRY AND STERILISING SERVICES AT KETTERING GENERAL HOSPITAL.

In order to maintain the maximum of economy in the provision of the undermentioned services and to improve the conditions of operation generally, a scheme of modernisation has been carried out at Kettering General Hospital, embracing the central heating, hot water supply, laundry, sterilising and infecting services. The principal factors influencing the adoption of the scheme were:—

- (1) The saving to be effected in the fuel costs by the use of a cheaper grade of fuel;
- (2) The reduction in fuel consumption as a result of higher efficiency in the boiler plant;
- (3) The elimination of the use of electricity for producing steam to supply the main sterilising equipment;
- (4) Improved services throughout the hospital as a result of centralisation.

It was also desired to reduce to a minimum the handling of solid fuel in different parts of the hospital so as to avoid the noise and dirt that occurred in firing many boilers which previously existed.

The extension of the services for the immediate and future additions to the hospital building which were under consideration also presented some difficulty, and it was realised that the existing apparatus could be extended more satisfactorily when supplied from a central plant.

Complex Situation

Kettering Hospital, like many similar hospitals throughout the country, has gradually increased its activities since it was first built, and extensions were added to the original building from time to time. In many cases these extensions were provided with new and independent heating and hot water supply installations, and it was often found impracticable to extend the existing apparatus. The result was that there were no less than 11 separate boilers in different parts of the building before the recent change took place. The boilers were serving hot water radiators, hot water storage cylinders, sterilisers, disinfectors and laundry machinery, and, in many cases, had already given the maximum period of service.

In addition to the main hospital block, the nurses' home, some 200 ft. away, contained its own system of heating and hot water supply.

After careful consideration of all the circumstances involved, it was decided to use steam as the prime medium for heat distribution, and to transfer this heat to water for the radiators and supplies of hot water by the use of calorifiers. One of the existing boiler houses and fuel store in the basement, under the centre of the hospital, was utilised as a calorifier and pump chamber, and a boiler house was built on vacant low-lying land at the end and to the rear of the hospital

block. This position was found to be most favourable for the new plant and for facilitating the return by gravity of condensation from the calorifiers. It was also convenient for the delivery of fuel. A brick chimney stack 100 ft. high was built to provide sufficient draught for the new boilers.

From the new boiler house steam and condense mains were taken underground in trenches constructed of brick and concrete to the calorifier chamber. Connections were made between the calorifiers and the various circuits of the existing apparatus, including that in the nurses' block some distance away. Provision was also made in the capacity of the mains to deal with future extensions, and valved outlets were left at appropriate points. Where the steam and condense mains passed below the operating block, connections were made to the existing sterilising equipment in this part of the hospital which was previously served by an electrical steam boiler.

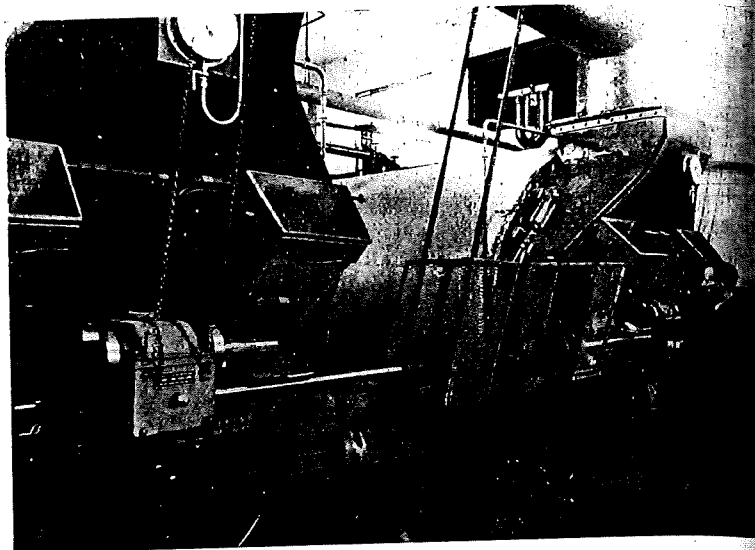
Vacuum System

The new plant was designed to work on the vacuum system, and comprises two Economic type steam boilers, each capable of dealing with the whole of the services connected to them, and with sufficient reserve capacity for future extensions so that one boiler is always available for use during overhaul and in case of a breakdown.

In addition to the usual accessories, the boilers were provided with low-water-level alarms and a steam pressure recording gauge. A water softening plant was also installed.

The boilers, which consume bituminous coal, are fired with overfeed type mechanical stoking equipment, of the coking pattern, with manual feed to the hoppers.

In the calorifier chamber are fixed central heating and hot water storage calorifiers in duplicate, provided



The Boiler House.

with automatic steam regulators. Duplicate central heating and hot water supply accelerators are provided for circulating the water from the calorifiers through the respective systems.

Efficiency and Economy

All condensation from the steam, except the foot water from the steriliser and disinfecting chambers, is returned to the boilers; and the whole of the circulating mains, where they are not used to give effective heating surface, are covered with insulating material in order to obtain the maximum thermal efficiency from the system. The condense mains are of copper tubing to ensure long life owing to the variable constituents of the water.

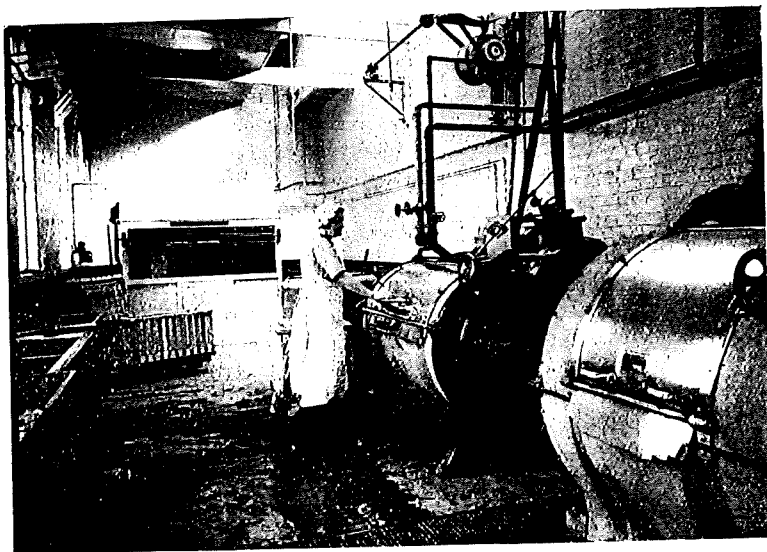
A new laundry, of larger capacity to deal with the increasing demands of the hospital, was also built adjoining the boiler house, and equipped with modern machinery served from the new boiler plant.

Gas, as an alternative fuel to coal, was considered, but was rejected owing to its prohibitive cost; and a considerable saving in fuel costs has been effected by the use of coal instead of electricity for the sterilising equipment in the operating block.

The consulting engineer for the work was Mr. F. Burlace Turpin, of London, and the contracting engineers were Messrs. Ashwell and Nesbit, Ltd., of London and Leicester. The architects were Messrs. Gotschall, Saunders, and Surridge.

The whole of the engineering equipment, including the laundry machinery, and the new buildings, were provided by the generosity of Mr. Alan Timpson, of Kettering.

The Laundry Washhouse.



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