CXXVI. AN ELECTRIC FURNACE FOR MICRO-KJELDAHL DIGESTIONS AND SIMILAR PURPOSES.

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IN carrying out micro-analyses on blood involving Kjeldahl and other incinerations the need for a suitable furnace was felt, and the apparatus described and illustrated in this note was therefore devised. Electrical heating was preferred to gas on account of its convenience and for another reason mentioned below.

The frame is of angle iron screwed to a teak base. The flasks are supported at an angle of 45° on a perforated sheet of asbestos, their ends projecting for about $\frac{1}{4}$ in. into openings cut in the lead pipe, *A*. A platform made from sheet asbestos supported by strips of angle iron carries two Ferranti 500 watt heating coils, which are held in place by the spring clips, *C*. Each coil serves to heat four flasks. The copper reflectors, *D*, shield the heating elements from draughts and greatly increase the available heat. The platform carrying the heaters is pivoted at the back, and the position of the heating coils relative to the flasks can be altered by raising or lowering the wing nuts, *F*. This arrangement affords a means of adjusting the rate of heating.

The fume absorber, *A*, which slopes slightly from left to right (Fig. 1) is fixed to uprights of spring steel so that its position relative to the flasks can be adjusted by means of the wing nuts, *H*.

Fig. 1.

The furnace can be safely used in a laboratory without a fume cupboard since when the lead pipe is connected to a good water pump and the unoccupied holes closed by lead slides no fumes escape into the atmosphere.

If the digestion mixture contains an appreciable quantity of water, Kjeldahl flasks are often cracked by water which condenses in the lead pipe and runs down the outside of the flasks. This can be prevented by placing rubber washers

round the flasks at a suitable height so that the condensed liquid drips into the metal trough, *J*, which should be coated with an acid-resisting paint.

In the author's experience micro-Kjeldahl digestions proceed much more smoothly with an electrically heated than with a gas-heated furnace. This may be due to more even heating of the contents of the flasks in the former case. Using the apparatus described for the digestion of whole blood it has been found that when the heating is suitably regulated no bumping takes place. Even with whole milk, a notorious offender in this respect, the amount of bumping is quite insignificant. Moreover, a sample of powdered dried grass, kindly submitted by Dr A. W. Greenhill of the Agricultural Research Station, Jealott's Hill, Berks, in the digestion of which over gas flames excessive bumping had been experienced, was digested on this apparatus with no bumping whatever.

SUMMARY.

An electric furnace suitable for micro-Kjeldahl and similar incinerations is described. The use of an electric furnace provided with a means of regulating the heating eliminates bumping.

I desire to thank N. Gruber for preparing the drawing and P. W. Batten for his assistance in building the furnace.

The apparatus can be obtained from Messrs Callas Sons and May Ltd., 65 Oxford St, Reading.