built because of problems of space and floor strength, to the Imperial College out-station at Silwood Park, Ascot. Here it will be used chiefly to test infrared systems, but Professor Ring hopes it will be possible to do some real astronomy through the moist air of Ascot. Although the important wavelengths at 10 microns are badly affected by water vapour, the band at 1 to 3 microns ought to be clearer and Professor Ring wants to record the infrared emission from the Orion Nebula. To get it out of the cellar, the telescope will probably have to be broken down into three components, and the Imperial College group is happy that the transfer will be accomplished safely.

Meanwhile the search for a permanent site for the 60-inch flux collector with the requisite minute amount of water vapour in the atmosphere has narrowed down to the Sierra Nevada Mountains in Spain and, rather pleasantly, Tenerife in the Canaries, where an inversion makes the atmosphere drier than expected for an island site. Testing is to go on at both places for most of the year, when the decision on the site should coincide with the completion of the 60-inch telescope expected by the end of this year. The mirror blank is at present being polished at Grubb Parsons optical works. Compared with an image size of 30″ of arc for the 40-inch telescope, the 60-inch telescope is expected to produce an image of 1″ of arc or so.

What form the 120-inch flux collector is to take—if it is built—is still under discussion, and much revolves around what wavelengths people most want to observe. One school of thought favours adding to the world's arsenal of 60-inch flux collectors before going to bigger instruments. These are questions which will have to be discussed before the British family of flux collectors grows further.

INSTRUMENTS

Microscopic Microanalysis

A POWERFUL new instrument which combines the facilities of an electron microscope and an X-ray microanalyser has been jointly developed by Tube Investment Research Laboratories near Cambridge and AEI Instruments at Harlow. The electron microscope microanalyser (EMMA) can simultaneously magnify and make an X-ray analysis of minute areas of material one tenth the diameter of the smallest objects visible in conventional electron microscopes. There are likely to be many uses for the instrument both in metallurgy, for which it was originally designed, and in biological and pollution research.

The advance which made EMMA possible was the invention of a miniature focusing lens to replace the bulky lens usually used in electron microscopes. The lens allows X-rays emitted at the surface of the specimen to be analysed by a series of spectrometers without interference from the lens. By removing the need to transfer a specimen constantly between a microanalyser and a microscope the new instrument makes possible precise analyses of small regions of the sample which are inaccessible by techniques involving two instruments. The electron beam in EMMA can be focused down to a diameter of about 1000 Å, and samples, which are in the form of thin films, can be magnified up to 160,000 times with a resolution of about 10 Å. The electron microscope is designed to operate at up to 100 keV, and in this range all elements with atomic number greater than about ten can be picked out by the spectrometers.

An interesting series of trials have already been carried out with EMMA. Surface cracks on steel tubing have been analysed and shown to contain particles of aluminium nitride with a diameter of 1500 Å, well below that resolvable in a conventional electron microscope. Certain steels are known to owe their creep resisting properties to plates in the structure, commonly thought to be silicon nitride. Analysis with EMMA revealed that some of the silicon sites were in fact occupied by manganese atoms, the presence of which had been concealed in the simple diffraction pattern.

Asbestos fibres extracted from a human lung have been identified in EMMA as coming from a particular asbestos known as Amosite. By studying these fibres, which are often only 1000 Å thick, it may be possible to find out more about the disease known as asbestosis. In another test, the eyebrow of a chick has been studied. The cells were found to contain more phosphorus and less calcium than did the extra-cellular space, in which there was an excess of calcium. Dust particles collected in the upper atmosphere by an American rocket have also been analysed, and the absence of nickel has precluded the possibility of their being micrometeorites. The tests suggested that the particles probably came from a steel works in Sweden, showing the great potential of the instrument for studying problems associated with pollution.

Sales for the new instrument, which will cost between £35,000 and £45,000, are likely to be at least fifty a year according to AEI. The chief sales problem is expected to be in making people aware of the range of research tasks that can be undertaken with the instrument.

ARCHITECTURE

Prize Universities

THE encouragement given by British universities to good architecture in the past few years is reflected once again in the new crop of Civic Trust Awards. Among the 198 schemes for new buildings, restorations or landscape projects that have been recognized by the trust for the top accolade, an award or for a commendation are twenty-six from universities. The trust says that the challenge of the pace of building programmes to meet the huge expansion in university expansion in the past ten years has been met "dramatically" by the university administrators and academics. Its praise does not all go to the new universities by any means—the Brynmor Jones Library at the University of Hull and the Oliver Lodge Laboratory and Senate House

University of East Anglia.