The Administration argued when it phased out graduate support grants from the National Science Foundation that graduate students would be able to pick up their support from project grants, and it has also applied the same argument to the NIH training grants. But the National Cancer Advisory Board looks on that argument with considerable scepticism, for although its recommendation that training grants be reinstated in theory applies only to the National Cancer Institute, several board members are particularly concerned about the effect on the cancer programme of cutbacks in other biomedical sciences.

The resolution adopted last week specifically points out that the National Cancer Act of 1971 specifies that the board, together with the director of the National Cancer Institute, should provide a sufficient manpower base in fundamental sciences and clinical disciplines to carry out the cancer program. "The Board feels that it cannot carry out those responsibilities in the absence of authority to fund training programs", the resolution states.

If the board's appeal falls on deaf ears in the White House, which seems likely, it is unlikely to go unheeded in Congress —Kennedy, for one, will probably try to get the training programs reinstated. But, if the history of the National Science Foundation's graduate training programmes is anything to go by, the Administration will get its way in the end. For the past three years, Congress has directed the Administration to increase its proposed spending on NSF graduate support grants, but each year the Office of Management and Budget has simply impounded the extra money.

AIR POLLUTION

Reducing Hazards

by our Washington Correspondent

THE Environmental Protection Agency has at last set controls on the discharge of asbestos, beryllium and mercury into the atmosphere. Designed to protect public health, the controls apply to milling and manufacturing industries, the demolition of buildings and the burning of wastes. They have taken more than two years to develop—a year longer than the Clean Air Act allows—and the EPA reckons that they will cost industry a little more than $50 million a year, with the chief cost falling on the demolition industry.

The three pollutants were chosen because they each have a potentially serious impact on public health, causing or at least contributing to increase in mortality, and serious and incapacitating illness. But, although the need for stringent control over their emission has been widely recognized, the EPA has had considerable difficulty in drawing up suitable regulations.

As for asbestos, it is extremely ubiquitous, tiny asbestos fibres in the atmosphere constitute a serious health problem, and it is very difficult to regulate. The fibres lodge in the lung, causing a debilitating and often fatal condition among asbestos workers, known as asbestosis. They have also been linked with cancer of the lung and with a variety of other cancers. A widely publicized study by Dr Irving Selikoff of the Mount Sinai Medical School, for example, has come up with the prediction that about 95,000 of the estimated 250,000 asbestos workers in the United States will eventually die of cancer.

Such considerations led a committee of the National Academy of Sciences to recommend last year that stringent controls should be placed on the emission of asbestos fibres into the atmosphere, but the setting of such controls has been hampered by the fact that satisfactory means of measuring ambient asbestos concentrations have only recently been developed, and a method of measuring asbestos emissions is still unavailable. The EPA even considered banning production, processing and use of asbestos completely, but eventually decided that such a drastic step would lead to the banning of extremely important uses of the material.

In the event, the agency decided to set visible emissions standards for a number of operations, and to require that a specific procedure be followed in the demolition of buildings. In short, the regulations set last week specify that there shall be no visible emission of asbestos from asbestos mills or from the manufacture of any product which contains asbestos, such as cloth, floor tiles and insulating materials.

As for demolition of buildings containing asbestos products, the regulations specify that the material should be removed before the building is demolished, that it should be wetted before removal, and that the EPA should be notified at least 20 days before demolition takes place. The regulations apply to all buildings except homes and apartment buildings with four living units or less. The controls are expected to increase demolition costs by about 8 per cent.

The beryllium and mercury standards were a little easier to draw up, because emission of each pollutant can be measured. The beryllium regulations apply chiefly to extraction plants, foundries and ceramic manufacturing plants and they specify that the maximum daily release of beryllium into the atmosphere from a plant should be 10 grams. As for mercury, the regulations specify that no more than 2,300 grams of mercury vapour should be released from stationary sources.

BALLOON RESEARCH

Long Life Aloft

by our Washington Correspondent

AFTER making two complete orbits around the Earth in 36 days, an experimental balloon carrying about 90 pounds of scientific instruments was brought back to the ground within 10 miles of its launching site in Australia last month. A second balloon, launched at the end of January, is still aloft after being becalmed over the South Pacific, and it is expected to complete its second orbit later this month. The flights, which were carried out as part of NASA's balloon research programme, represent the first succesful orbiting of scientific instruments by balloon, and they are an important step on the way to development of a balloon capable of orbiting up to about 500 pounds of instruments at 130,000 feet, and of staying aloft for six months or more.

Although the balloons carried scientific instruments—cosmic ray detectors and micrometeorite collectors—the chief objective of the flights was to test the performance of a new type of balloon. Called super pressure balloons, they are designed to fly at an altitude determined by constant atmospheric density, and unlike conventional balloons, they have no valve for venting gas when excess pressure builds up. Consequently, the skin must withstand changes in pressure caused by temperature changes between night and day, and it must also be resistant to degradation by ultraviolet light and fast moving micrometeorite particles.

Conventional balloons are usually inflated on the ground and lift the payload to the required height. As the altitude increases, the balloon expands and excess pressure is vented from a valve at the base, but at night, when the temperature drops, the balloon shrinks and descends. The skin is, however, not completely elastic, and when the balloon expands again during the day, it vents some more gas. Consequently, conventional balloon flights provide only a few hours worth of scientific results.

Super pressure balloons, on the other hand, are constructed of material which can withstand the excess pressure developed by changes in temperature, and they are also designed to be resistant to degradation by strong ultraviolet light and fast moving dust particles in the upper atmosphere. The two balloons which NASA has been orbiting will now be carefully studied for signs of wear, and if they have survived their flight successfully, the prospects for lifting payloads to 130,000 feet for several months seem very good.

If NASA's objective is attained, super pressure balloons would open up considerable new possibilities for upper