been to see what industry claims is attainable with the technology at hand and making that the basis of legislation, whilst allowing pollution that it is not economically feasible to control to continue unabated.

The policy of putting the horse before the cart has drawn the predictable reaction from the car industry. "General Motors does not at this time know how to get production vehicles down to the emission levels that your bill would require for 1975 models", the president of General Motors, Mr E. N. Cole, wrote in a letter to Senator Muskie; "accomplishment of these goals, as far as we now know, simply is not technologically possible within the time frame required". The refrain was echoed by Mr Lee Iacocca, president of Ford's North American automotive operations, who said the requirement to reduce vehicle emissions by 90 per cent "could prevent production of cars after January 1, 1975".

Table 1. AUTOMOBILE EMISSIONS PERMITTED BY PROPOSED FEDERAL STANDARDS AND BY THE SENATE BILL (IN GRAMS PER MILE)

	Hydrocarbons, new test	Carbon monoxide, new test	Nitric oxides, old test	Particulate matter, old test
Uncontrolled	14.6	116.3	4.0	0.4
1970 standard	2.9	37.0	—	—
Proposed 1975 standard	0.5	11.0	0.9	0.1
Proposed 1980 standard	0.25	4.7	0.4	0.03
Bill language (90 per cent reduction of 1970 or uncontrolled)	0.29	3.7	0.4	0.04

The princes of Detroit might have won more conviction for the prophecies of their own demise had it not been for the annual Clean Air Car Race, run between the Massachusetts and California Institutes of Technology, in which student engineers are scored for the cleanliness as well as performance of their vehicles. Results of this year's contest, announced only a few days before the Senate debate, showed that the Federal emission standards proposed for 1980 (and by Senator Muskie's bill for 1975; see Table 1) were well within the grasp of the college teams, even though no single vehicle met the levels set for all three classes of emission (hydrocarbons, carbon monoxide and oxides of nitrogen). The winner of the race, a modified Ford Capri, entered by Wayne State University, emitted 0.19 grams per mile of hydrocarbons and 1.48 of carbon monoxide, both of which are better than the standards set by the Senate bill, and its emission of oxides of nitrogen was very close to standard.

Where Wayne State University had led, could not Ford and General Motors follow? Their wellwishers on the floor of the Senate explained that there was all the difference in the world between the Wayne State entry and a vehicle suitable for mass production. For one thing, the student car had four converters using a prohibitively expensive platinum catalyst; for another,

the manufacturers are being required by the bill to guarantee their vehicles' cleanliness for 50,000 miles. The Senate on this occasion refused to be blinded with technology. Mr Muskie pointed out that the deadline in his committee's bill allows the car manufacturers two years to do the necessary research and development and another two years in which to apply that technology to the mass production of automobiles. If the technology to get to the Moon could be developed in ten years, Mr Muskie implied, the requirement to reduce car exhaust emissions by 90 per cent in four years was asking for rather less.

The most telling argument against the manufacturers is that cars and other vehicles are responsible for nearly half the total air pollution, accounting for some 42 per cent of the estimated 214 million tons of pollutants released into the air in the United States in 1968 (see Table 2). "Detroit," Senator Muskie remarked, "has told the nation that Americans cannot live without the automobile. This legislation would tell Detroit that if that is the case, they must make an automobile with which Americans can live."

BIOLOGY

Coping with *Acanthaster*

by our Washington Correspondent

FUNDS totalling \$4.5 million have been voted by Congress for a five year programme to control the crown-of-thorns starfish, *Acanthaster planci*, whose ravages of Pacific coral reefs have reached epidemic proportions in the last few years. The programme, which is to be administered by the Department of the Interior and the Smithsonian Institution, calls for research into the ecology of the starfish, together with the development of better methods of control.

The immediate beneficiaries of the programme will be the Pacific territories of the United States such as Guam and Hawaii. Since 1967 more than 23 miles of the coral reefs round Guam have been almost completely destroyed by the starfish. In Hawaii a serious infestation has been found off the coast of Molokai island. Elsewhere in the Pacific the Great Barrier Reef is the best known casualty, having been denuded of 100 square miles between 1964 and 1966. (A recent survey of the Reef, however, suggests that regeneration of the coral may not be so protracted a process as is supposed (see *Nature*, 227, 5; 1970).)

The bill authorizing the *Acanthaster* research programme passed the Senate in April. In last week's debate in the House, Representative Mink of Hawaii suggested that the funds should be used to set up a Coral Reef Institute which, she thought, should be situated with the University of Hawaii. To begin with, the Institute would devote its energies to the *Acanthaster* problem but, with that solved, it would turn to other questions of coral ecology such as the effects of algae and fish farms being established in the Philippines.

The Smithsonian Institution will use its share of the funds to study the general biology of the crown-of-thorns starfish whilst the Department of the Interior will study control methods. So far the most effective method of halting the plague is for divers to inject starfish individually with formalin or ammonium hydroxide.

Table 2. EMISSION OF AIR POLLUTANTS IN THE UNITED STATES, 1968 (MILLIONS OF TONS)

Source	Carbon mon- oxide	Partic- ulates	Sul- phur oxides	Hydro- carbons	Nitro- gen oxides	Total
Transportation	63.8	1.2	0.8	16.6	8.1	90.5
Fuel combustion in stationary sources	1.9	8.9	24.4	0.7	10.0	45.9
Industrial processes	9.7	7.5	7.3	4.6	0.2	29.3
Solid waste disposal	7.8	1.1	0.1	1.6	0.6	11.2
Miscellaneous	16.9	9.6	0.6	8.5	1.7	37.3
Total	100.1	28.3	33.2	32.0	20.6	214.2

(From the report of the Council on Environmental Quality.)