Clean water: How high the cost?

There is little doubt clean air and water are becoming partisan political issues. The first confrontation came last year when the Administration opposed rigid auto emission controls drafted by Sen. Edmund Muskie's air and water pollution subcommittee and passed by the Senate. The final version hammered out by House and Senate conferees conformed closely to the Muskie version, but the President nonetheless signed the bill into law. Now, however, economists are having second thoughts over the economic wisdom of the auto emission controls—which may cost as much as $4 billion annually, money that might be spent elsewhere with a greater net gain to clean air (SN: 11/13/71, p. 332).

This year, Muskie's subcommittee drafted new water pollution legislation, and it passed the Senate unanimously. This time, the question of economic wisdom has become the prime focus of contention.

Last week, the House Public Works Committee reported out its version of the bill, and the economic aspects will surely occasion the major debate on the House floor and in conference when Congress reconvenes next year. It appears that by making his bill too tough, Muskie may have played into the hands of Administration conservatives who are trying hard to create an environmental backlash based on the alleged high cost of pollution abatement.

The Muskie bill calls for an absolute cessation of pollutant discharges into navigable waterways (virtually all waterways) by 1985, with interim goals for 1976 and 1981. The House version supports the no-discharge provision (although it refers to it as a "goal" rather than a "policy," the latter word Muskie's). This is a radical departure from earlier clean-water laws, which are based on maintaining "water quality," that is, tailoring of effluent limits to the "highest beneficial use" of the waterway in question. The House version does not altogether abandon this concept as does Muskie's bill.

The problem in attaining perfection in both air and water pollution abatement is that the cost of achieving a certain quantum of control gets much higher the nearer 100 percent clean-up is approached. Paul W. McCracken, chairman of the President's Council of Economic Advisers testified at House hearings, for instance, that it will cost about $0.7 billion per percentage point to clean up the nation's waters to 85 to 90 percent. Then the next 10 percentage points will cost about $6 billion each and the final few points $60 billion each. McCracken figures the no-discharge goal will cost around $300 billion to achieve. Although McCracken's figures can certainly be questioned in a field where there is a shortage of precise data, engineers and scientists generally agree on the steeply rising cost curve.

Furthermore, the no-discharge provision is probably not necessary to achieving water quality high enough to protect environmental values, Administrator William D. Ruckelshaus of the Environmental Protection Agency testified. Ruckelshaus, who, unlike McCracken, cannot be counted among Administration conservatives, admitted that data are not yet available to delineate precise relationships between the kinds and amount of effluents that enter waterways and the quality of ambient water. But he said he expected EPA to have the data by 1976. In the meantime, efforts should be accelerated to abate gross pollution. Then in 1976, precise effluent goals could be promulgated, Ruckelshaus suggested.

Another point of conflict between Muskie and the Administration is over the degree of Federal "oversight" of state water programs. Muskie wants EPA to have veto power over state decisions on each particular industrial effluent permit; the Administration is holding out for a far greater degree of state autonomy. House public works committee members, in leaning to the Muskie version, apparently believed environmentalists who told the committee that state efforts to date under existing laws have failed woefully.

A major problem with environmental legislation to date has been its too-great emphasis on abstract goals—such as "no discharge"—without reference to costs and benefits. The House version of the water bill calls for a study by the National Academy of Sciences of "the social, technological and economic effects" that would result from achieving the interim 1981 goals. Such a study, combined with EPA's study of effluents related to ambient water quality, might help make environmental legislation more rational and less political. □

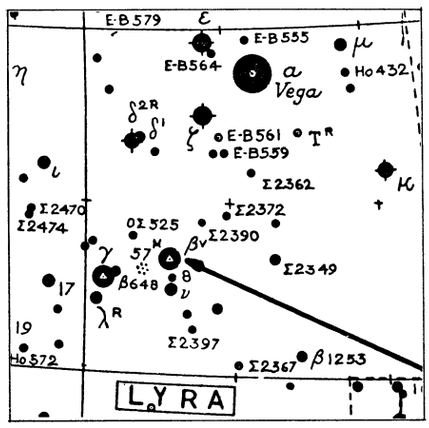
On the invisible trail of binary black holes

A black hole is by nature invisible, and its name underlines the fact. A creature of modern theories of relativity, a black hole is a celestial object that has collapsed so far under the influence of its own gravity that its gravitational field is too strong for any matter or radiation to escape (SN: 12/26/70, p. 480).

A black hole is thus cut off from communication with the rest of the universe by light or radio or X-rays or emitted particles. However, it still exerts gravitational forces, and its presence could be detected by its effect on other visible bodies.

Binary stars, systems in which two stars are bound together gravitationally and revolve around each other, are an obvious place to look for black holes. Suppose that one member of a binary system became a black hole while the other remained visible. The black hole's presence could be deduced from the motion of the visible one.

Some astronomers have suggested



Norton's Star Atlas

Beta Lyrae: May have a black hole.

that there is more or less evidence for the existence of black holes in one or more binary systems. Others deny it. Several parts of the simmering argument have become public in recent weeks.

The first candidates for black hole status were eclipsing binaries. In an eclipsing binary the two components, one usually much darker than the other, periodically pass in front of each other,