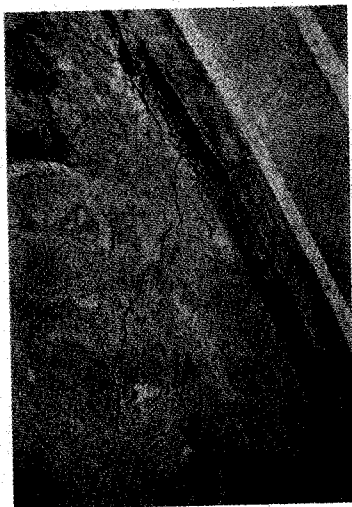


Fig. 1. European moth species named *Biston betularia* adapted to pollution, in the Birmingham industrial district of England, by changing from dominantly light colored to dominantly dark in less than 100 years. Dark form, known appropriately as *carbonaria*, is safer from preying birds when it rests on soot-blackened trees; thus the gene for dark coloring has become more abundant in the population. Man's problems with polluted air are not so simple, nor so easily solved.



Fig. 2. Limestone outside facing of the National Gallery in London (below) shows typical results of accelerated weathering caused by high concentration of SO_2 in urban air. SO_2 is oxidized and hydrated to sulfuric acid— H_2SO_4 —which attacks limestone ($CaCO_3$) and converts it into the hydrous mineral gypsum ($CaSO_4 \cdot 2H_2O$). This reaction helps break up original surface and gypsum's greater solubility in rain water finishes the destructive job. The same difficulties, except for the last one, are encountered indoors, as in the Arena Chapel in Padua, Italy, where "Mission of Gabriel" fresco by Giotto shows tan powdery efflorescence of gypsum crystals formed by H_2SO_4 attack on lime in the underlying plaster.



carbons and oxides of nitrogen in the air. Automobile exhausts are a prime contributor of both of these raw materials, but large power plants add a fair share of nitric oxide, and open burning of wastes as well as imperfectly designed or operated incinerators add other organic materials to the picture. The problems caused by sulfurous fuels were formerly known as London smog, but they too are more widespread than the name suggests.

This is an ash-soot-sulfur dioxide-sulfate complex to which industrial, electric-power generating, and domestic heating exhaust streams are the chief contributors.

Hydrocarbon compounds that may number into the thousands and that include carcinogenic polycyclic members of the family—such as 3-4 benz-pyrene—nitrogen oxides, sulfur dioxide, sulfates, soot (mostly carbon), and fly ash are not the only things present in re-