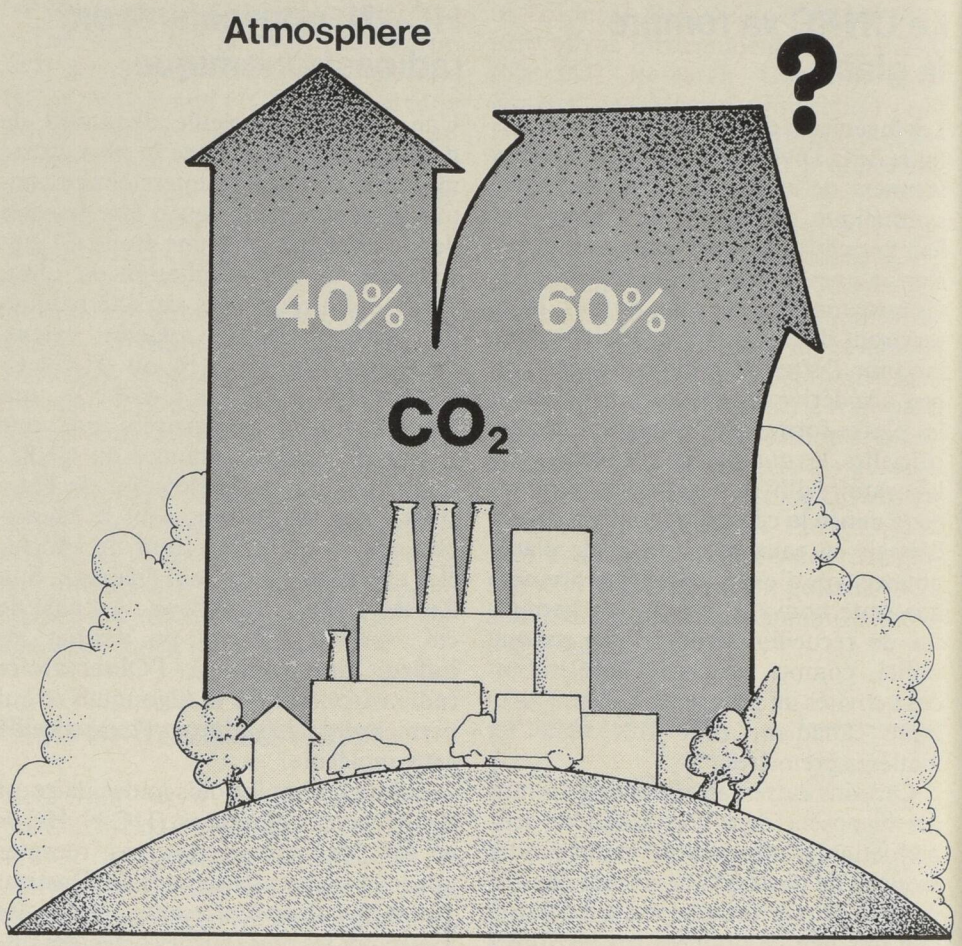
Problem or nirvana?

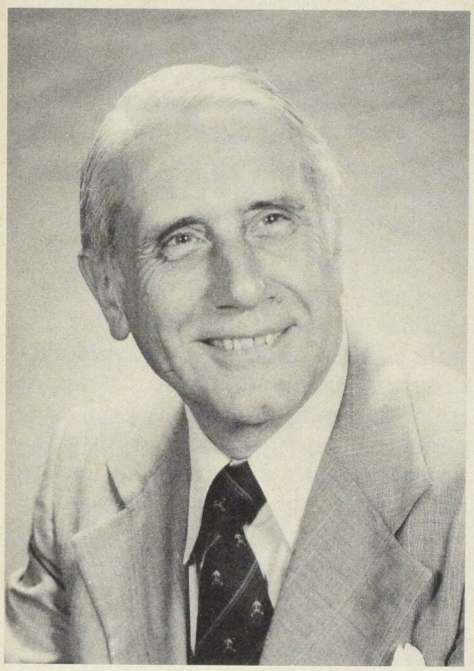
CO_2 increase in the atmosphere

Is the increase of carbon dioxide (CO_2) in the atmosphere a global time-bomb or will it be of minor consequence, perhaps even creating some benefits? This complex question was addressed by an eminent Canadian climatologist, Dr. Kenneth Hare, in a lecture given to the National Research Council.



Much confusion has existed in the scientific community on the impact of increasing CO_2 levels on world climate, a situation caused in large part by the burning of fossil fuels: oil, coal and gas. Hare began his lecture by emphatically stating that "the build-up of CO_2 in the atmosphere is an empirical fact supported by continuous world-wide measurements since 1958." His graphs showed clearly that in the northern hemisphere, CO_2 increased remorselessly over 20 years at a rate of about one part per million (ppm) each year, starting at 315 ppm in 1958 and rising to 335 ppm by the end of 1975.

It has been estimated that the combustion of fossil fuels releases 5.6 billion t into the atmosphere every year. But not all of it stays there, and the net rate of increase is actually about 40 per cent of this total, or 2.4 billion t per year. Where the other 60 per cent goes is perplexing scientists and the situation is made even more mysterious by the fact that there are other large sources of CO_2 release to the atmosphere which cannot be accounted for either. Recent estimates show that the amount of carbon released from surface and soil equals that from fossil fuel combustion.



An eminent Canadian climatologist, Dr. Kenneth Hare, spoke to NRC on the effects of the CO_2 increase in the atmosphere. *(Photo: Photothèque)*

Dans son exposé présenté au CNRC, le Dr Kenneth Hare, éminent climatologiste canadien, a traité des effets d'une augmentation de la concentration du CO_2 dans l'atmosphère.

Most of this probably ends up in the oceans, but a sizeable fraction remains unaccounted for. Dr. Hare sees this as a perturbation in the Carbon Cycle (one of the great cycles of nature) among reservoirs which are immense. The atmospheric reservoir, for example, contains 710 billion t of CO_2 and it is to this store that 2.4 billion t are being added each year — a rapid increase for a reservoir of this size.

According to Hare, the other reservoirs in the Carbon Cycle are difficult to monitor accurately. Much more carbon is located in the deep oceans, in solution, in inorganic form, and in sediments on the ocean floor. There are also sedimentary rocks (formed by carbon materials sedimenting in ancient seas) now on land which contain immense supplies of carbon. About 600 to 830 billion t of carbon are tied up in terrestrial plants and animals while another 60 billion t are bound in the litter on the surface. Another 1 670 billion t of carbon are mixed in the soil. Hare concedes that all these figures have a considerable margin of error and might even be off by 20 to 30 per cent.

The inability to balance the CO_2 budget makes it difficult to develop reliable computer models to gauge the extent of the effects of CO_2 release into the atmosphere. Several models do exist, and they all agree on one important point; as the CO_2 increases, *the atmospheric temperature will rise.*

The model Hare considers best was developed strictly on the basis of the known increase of CO_2 in the atmosphere and tied to projections for fossil fuel utilization in the future, using one scenario of gluttonous consumption and another of moderate use. The glut-