

The Kyoto commons — A tragedy?

Although 120 countries have approved the Kyoto Protocol to the United Nations Framework Convention on Global Climate change since it was negotiated in 1997, full ratification remains elusive. The United States, the top producer of greenhouse gases, pulled out of the accord in 2001. Canada ratified the agreement in December 2002, but has a new Prime Minister whose support for Kyoto seems guarded at best. Australia has not ratified the agreement, preferring a “voluntary” approach to reducing greenhouse-gas emissions. In recent weeks the plot has hinged on Russia, the fourth leading producer of greenhouse gases, and whose participation is needed to meet the requirement for at least 55 countries, accounting for at least 55% of the industrial world’s greenhouse-gas emissions, to sign on. Without Russia, the agreement will fall apart.

The earth’s average temperature (15°C) results from our proximity to the sun and the effects of the atmosphere, a protective heat-exchanger that reflects about a third of the sun’s energy and permits the reverse passage of infrared radiation away from the earth. Although natural events such as volcanic eruptions and changes in the sun’s irradiance affect the earth’s temperature, such influences are minor. By far the greatest changes are anthropogenic, resulting from the release of gases that exacerbate the “greenhouse effect”: carbon dioxide, methane, nitrous oxide and fluorocarbons.¹ The concentration of greenhouse gases has been increasing since the industrial revolution in the mid-19th century,² and in the past 25 years the global surface temperature has increased by 0.4°C. This may seem trivial, but it is equivalent to the temperature increase for the preceding 100 years. Each 1°C increase allows the atmosphere to hold 6% more water; most experts are convinced that the far-reaching implications of this are already evident in floods and droughts, widening geographical distribution of vectors of infectious disease, increased air pollution and rates of respiratory illness, and so on.¹ Estimates of additional temperature increase by the end of this century range from 1.7°C to 4.9°C.²

The Kyoto accord is imperfect in many ways. Plans of action and means of compliance monitoring are not clear; the country-specific carbon dioxide targets, which apply different yardsticks to countries at different stages of economic development and allow for a dubious trade in “car-

bon credits” are disputed; and progress is lagging far behind the protocol’s self-imposed deadlines.

But it is a start, even an impressive one, given the need for economically and militarily competitive nations to cooperate. That the atmosphere is the ultimate shared resource was evident to Jules Verne in 1872 when he sent his fictional Philéas Fogg around the globe in a balloon in 80 days, as it was to us much more recently when Bertrand Piccard and Brian Jones actually accomplished the feat in 19. Air masses currently overhead in Canada will be half-way round the world a week later.

In a famous essay published 36 years ago, Garrett Hardin³ described how each person’s use of a common resource causes a net loss to the collectivity. On a village commons for the grazing of animals, for example, the productivity of the common pasture falls with the addition of each new animal; eventually, the commons is destroyed by overgrazing. Speaking to the specific problem of population growth, Hardin argued that the “tragedy of the commons” belongs to a class of problems that have no technical solution. Rather, it requires a “change in human values or ideas of morality.” One might say the same about global warming.

Certainly there are interim technical approaches to our reliance on fossil fuels that would slow the degradation of the atmosphere if they could be developed and implemented quickly. But, given that human population projections to the year 2300 are as high as 36.4 billion, and that our current demand for energy resources is apparently boundless, the only real solution will be a change in values and a universal commitment to the preservation of the global commons of earth’s atmosphere. The accord is not perfect, and its targets will surely not be met by 2012, but agreement on its fundamental goal and the values underlying that goal are reasons enough to persevere. — *CMAJ*

References

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