or, in a case of adversarial verification may encounter the risk of destruction of the aircraft. The recent agreement to permit Open Skies overflights has restricted their use to confidence-building, and has so far not extended to verification, although this is expected to occur in the future of the CFE.*

The concern over the deteriorating global environment is motivating an energetic program for atmospheric pollution monitoring, including the ozone layer, on land and on water. Objectives include arrival at an understanding of the magnitude of the problems and of the best means of alleviating them, and may also extend to the precise identification of pollution sources. Monitoring instruments can be placed on the ground and on ships, sounding rockets, balloons, aircraft and satellites. Much has been learned about the structure of the atmosphere from radiometers and sounding instruments operating at radio and optical wave lengths, but it is probable that the detection and identification of atmospheric pollutants will best be achieved by "lidar." This type of instrument resembles radar, but uses short pulses of laser radiation, which interact with small concentrations of aerosol chemicals and return echoes revealing both the location and composition of the material. Lidar can also locate and identify small concentrations of pollutants on water surfaces. Satellites provide the best platforms for global monitoring by remote-sensing techniques, and do not require permission from investigated parties. Aircraft offer the important advantage of being able to fly right through identified concentrations of pollutants in the lower atmosphere, and to collect physical samples for subsequent analysis. They may also be able to fly low enough to detect unusual radioactivity on the ground.

If the U.S., other countries or a group of nations pursues plans to control air pollution, they will have to establish some form of monitoring agency able to detect, locate and measure the quantities of controlled material released into the atmosphere. It seems possible that such surveillance might be able to provide information useful to those attempting to verify the development or manufacture of chemical weapons, or the testing of NBC weapons.

In conclusion, it should be noted that synergy also works in the opposite direction. Systems designed and operated primarily to verify arms control agreements could also have useful non-military functions. These include environmental monitoring, resource development, cartography, plotting ice cover, search and rescue, and alleviating the consequences of natural disasters, such as forest fires and floods. Some systems could also be used for security-related operations, such as peacekeeping, or enforcement functions, such as fishing control. It would be a waste of resources to confine the use of an expensive system to one application if it is also capable of other sensing with a small additional marginal cost. Further, such secondary applications could offset the cost of an Open Skies program.



* The Preamble to the Open Skies Treaty notes that signatories intend to develop the Open Skies regime to deal with such areas as the environment.