sensors, and wavefront processors that compensate for waveform distortions caused by irregularities and misalignment of large optical surfaces — has yet to be proved [J. Richard Vyce and John W. Hardy, "Adaptive Optics: Potential for Verification," in *Arms Control Verification: The Technologies That Make It Possible*, ed. Kostas Tsipis, David W. Hafemeister, and Penny Janeway (Washington, D.C.: Pergamon-Brassey's International Defense Publishers, 1986), pp. 97-103].

10. Herbert F. York, "Reconnaissance Satellites and the Arms Race," in *Arms Control and Technological Innovation*, ed. D. Carlton and C. Schaerf (New York: John Wiley, 1976), p. 229. At one time, the United States planned to develop a system of satellites that would permit daily global coverage (designated "KH-X"). However, the idea was apparently discarded due to the system's projected processing and analytical demands (Adam, "Verification: Peacekeeping by technical means," p. 51). According to one estimate, 3 468 individual photographs, each covering an area 450 km by 1 000 km at a resolution of 20 m (sufficient for general detection of troop units only), taken by two shuttle-launched reconnaissance satellites would provide complete global coverage. One mile of film would be required to record the photographs (Schroeer, *Science, Technology, and the Nuclear Arms Race*, p. 377).

11. Brams and Kilgour model the verification problem as a game of treaty compliance: the inspectee may comply with or violate the treaty, while the inspector may accept or challenge the inspectee's stated compliance [Steven J. Brams and D. Marc Kilgour, *Game Theory and National Security* (New York: Basil Blackwell Inc., 1988) pp. 143-168]. This view of the problem is different from the search and evasion game referred to here.

12. Events A and B are dependent, i.e., the probability of Event B depends upon whether Event A has occurred. For example, if the sensors "look in the right block," the probability of identification equals .95. However, if the sensors "look" elsewhere, the probability of identification is zero (one cannot identify what is not observed). Thus, the probability of Event B changes depending upon the occurrence of Event A.

13. Note the probability estimate refers to the detection of the violation "at least once." In other words, the concern is not with the probability of detecting the violation once and only once. From the defender's perspective, it does not matter whether it is seen one or many times, so long as it is detected. Thus, the estimate defined here is a cumulative probability — p(one detection) + p(two detections) + ... + p(L detections).

14. See the Appendix, p. 39, for the derivation of this equation from the binomial probability distribution.

15. In fact, the violation will most likely be seen three times during the detection period — the probability of three detections equals .2236.

16. Assumptions regarding aircraft and sensor characteristics are found in *Airborne Remote Sensing for CFE Verification: The Platform*, SER-8-2295 (Toronto: Boeing Canada, de Havilland Division, 1989).

17. Ibid., pp. 6-7.

18. Ibid., p. 17

19. Admittedly, a state may sign an arms control agreement with the intention of subsequently circumventing the treaty and gaining a military advantage, however slight or fleeting. In such circumstances, though, the treaty violation is not inadvertent, and the routine deterrence scenario posited here, and the binomial model describing it, would not apply.