5. I. Niven, Irrational Numbers, Mathematical Association of America, Washington, DC, 1956.
6. J. Oxtoby, Measure and Category, Springer-Verlag, New York, 1971.
7. J. Oxtoby and S. Ulam, Measure-preserving homeomorphisms and metrical transitivity, Ann. of Math., 42 (2) (1941) 874–920.
8. W. Rudin, Real and Complex Analysis, McGraw-Hill, New York, 1966.
9. ______, Well-distributed measurable sets, this MONTHLY, 90 (1) (1983) 41–42.

LION-HUNTING WITH LOGIC*

HOUSTON EULER
c/o Leon Harkleroad, 4417 Woodgate Lane, Louisville, KY 40220

Over the years there has developed a body of literature on the use of mathematical techniques to catch lions ([**1**]–[**6**]). In this literature there has been a comparative shortage of proofs based on mathematical logic. If those of us who commit logic believe in the vitality of our field, we cannot afford to allow such a shortage to continue. The following proofs, then, are offered as a first step towards rectifying the situation.

1. *Nonstandard Analysis.* In a nonstandard universe (namely, the land of Oz [7]), lions are cowardly and may be caught easily. By the transfer principle, this likewise holds in our (standard) universe.

2. *Set Theory.* If the set of lions is bounded, you can simply build a cage around the boundary. So assume that the set of lions is unbounded. It will then have an element in common with a stationary set. But a stationary lion is trivial to capture.

3. *Set Theory.* Assume $V = L$. Since the lion is in the universe, it is constructible. So just carry out its construction within a cage in the first place.

4. *Set Theory.* Assume AC. Perform a Tarski-Banach decomposition on the lion to halve its size. Repeat until the lion is small enough to be captured easily.

5. *Recursion Theory.* Assume you can capture a lion. Having done so, you can easily bring it to a standstill, and you would thus have a solution to the halting problem. Since the halting problem is unsolvable, you *cannot* capture a lion after all.

In conjunction with the previous results, we have

COROLLARY. *Mathematics is inconsistent.*

This corollary, besides being of intrinsic interest, also provides solutions to the Riemann Hypothesis, Fermat's Last Theorem, and other questions (besides giving a proof of the Four-Color Theorem that does not require a computer!).

References

1. H. Pétard, A contribution to the mathematical theory of big game hunting, this MONTHLY, 45 (1938) 446–7.
2. I. J. Good, A new method of catching a lion, this MONTHLY, 72 (1965) 436.
3. C. Roselius, On a theorem of H. Pétard, this MONTHLY, 74 (1967) 838–9.
4. O. Morphy, Some modern mathematical methods in the theory of lion hunting, this MONTHLY, 75 (1968) 185–7.
5. P. L. Dudley, G. T. Evans, K. D. Hansen, I. D. Richardson, Further techniques in the theory of big game hunting, this MONTHLY, 75 (1968) 896–7.
6. J. Barrington, 15 new ways to catch a lion, Manifold, Issue 18 (1976), reprinted in Seven Years of Manifold, Shiva Publishing, 1981.
7. L. F. Baum, The Wonderful Wizard of Oz, 1900.

*This research received compact support from Tombs grant LWH-42755.