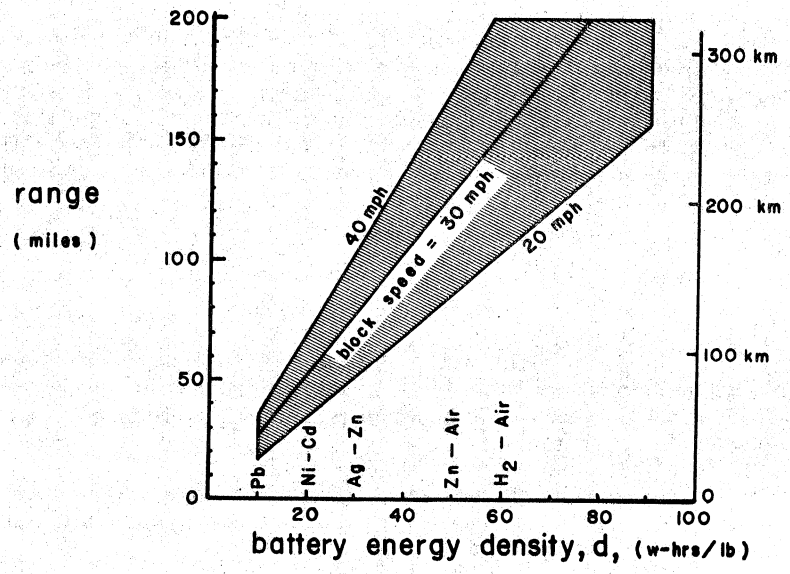

FIGURE 10.—Range of city-driven electric automobiles.

Range was only slightly affected by W in the steady-speed cruise mode, and now—under metropolitan driving conditions—the range of electric automobiles seems independent of W. One may surmise from this, that the present spectrum of car weights (from 2,000 to 5,000 pounds) and configurations (from small to large luxurious) available for consumer choice, need not change with the substitution of electric energy for combustion.[8] Figures 9 and 10 also imply that conventional batteries are unsuitable for most consumer range demands. Much better suited are the Zn-air, H_2-air and other as yet to be fully developed air batteries (for example the metal air batteries such as Fe- or Mg-air), since these yield quite respectable ranges between refueling and recharging.

It should be noted that the mission profiles in figure 9 are the most arduous that one can normally expect. Travel along routes with few stop signs or with well-coordinated lights, combined with a driver's more moderate use of the accelerator pedal than the full power assumed in (11), could result in ranges up to twice those exhibited in figure 10. They approach the ranges of gasoline-powered cars with a single thankful of fuel.

As a concluding example consider: a middle-weight automobile (say, 3,000 pounds), capable of 100 miles per hour top speed, but averaging block speeds of 30 miles per hour in the metropolis, owned by a driver insisting on a 150-mile range between refueling. This requires batteries of 50 to 60 watt-hours per pound energy density, and needs 80 to 90 kilowatt-hours to be stored in the vehicle.

[8] This conclusion contrasts with the English policy of designing very small electric cars, if any. Furthermore, the massive engineering effort in the United Kingdom toward "electricars" is erroneous in not attempting speeds higher than 40 miles per hour, or ranges greater than 40 miles.