

to such people, and their fewness hampers commercial sustention. Some remarkable starts have been made, but only starts,³⁵⁸ on inventions enabling the blind to sense their surroundings, and to read ordinary print (§ 336), and the deaf to hear with no ear at all. Again, the usual sequence of stimulus→thought→action has been reversed, just as the sequences in mathematics, physics, and chemistry are often reversed. A chimpanzee was induced to wave his arms, and his concomitant brain waves were recorded. Then these waves were played back into his head, whereupon he waved his arms. Does this mean that we could automatically, electrically put ideas into a person's mind? If so, we would have a great invention for man's colossal problem, the better ordering of the minds of men.

[351] An easier cybernetic invention-class, already started like all we discuss, and one peculiarly requiring the cooperation of civil government, is the *safety control of automobiles*. Devices like automatic seat belts, that will protect riders whether they bother about their lives or not, anticollision devices such as the headlight dimmer (§ 222), and above all automatic steering and speed control, are babies needing adoption. As ships have been steered through mine fields, by electrically sensing and following a cable pulsing with alternating current on the harbor bottom, so automobiles could follow in any weather cables buried in the roadway, proceeding at speeds uniform, swift, and safe, while the (occasional) drivers occupied themselves with the scenery, TV, or what they will.

[352] We might add here an invention which one would think commercial enterprise certainly could and should have provided—automobile locks able to protect a car and its contents from thieves. But since private enterprise has failed to supply this, during fifty years of need, perhaps the state should take up the problem. For an additional motive, we are concerned to stop a principal inducement and support of juvenile crime.

4. OTHER ELECTRICAL INVENTIONS

[353] Governments are very active toward securing power from *atomic* fission and fusion. But even more valuable might be development of burning coal in the mine, to produce electricity, heat, gas and/or chemical products, as the Russians and others have been doing experimentally. It would also remove smoke from our cities, reduce the unhappy trade of the coal miner, and economize our natural resource. Government inventing is also appropriate for *power directly from heat* and light,³⁵⁹ as in some recent military and Telephone work on solar and other batteries.³⁶⁰ Perhaps Government should also do more on *radiation sources* emitting only alpha and heat rays, easy to shield, safe, and available for minor engines like an automobile's. But this is inevitably tied up with the propulsion of space craft and planes and other war transport. Low temperature-differentials, if they could be efficiently harnessed, could yield abundant power from tropical surface versus deep seawater, or from northern ice versus the underlying water. Much the same needed inventions and scientific discoveries are tied up with the fractionation of *seawater*, and of brackish or alkaline waters abundant in various regions American and foreign, to yield locally scarce fresh water, and separated salt with its numerous