

minor constituents, including sodium, chlorine, bromine, and magnesium already being extracted, and iodine, potassium, silver, gold, etc. Long featuring in this author's lists of invention infants crying for adoption, the better extraction of fresh water from marine or brackish sources was taken seriously in hand by Congress in 1952, as well as by eight or more other nations and by commercial enterprise. Our Office of Saline Water had 40 projects in hand at once, mostly farmed out, with a budget of \$825,000 for 1959, \$1,750,000 for 1961, \$12.5 million estimated for 1964, and such growing success and use reported over the world as to demonstrate what a government can do with a fundamental civil invention, which has been struggling along since ancient Greek times. There are a surprising number of ways for separating salt and water, but none is easy to make cheap enough, since the unavoidable energy input equals what would raise the water 1,000 feet.³⁶¹

[354] *Electroluminescence*, and *chemical luminescence* are two new general ways by which light might be produced with much less heat and required energy than today, and with inviting architectural features of wide, softly glowing surfaces. Our experience with fluorescent lighting (§ 316) suggests that private industry may need prod- ding to reduce its market for current.

[355] The control of *smoke*, *smog*, and *dust*, from automobile ex- hausts and all the other myriad sources, is a problem of growing im- portance and realization, which private industry can never solve nor even help much, because the creators of the nuisances afflict others much more than themselves. They would lose more through the costs of the abatement devices, and a thousandfold more if they had to invent them, than they would gain for themselves. Yet they are afflicting a whole city, and helping kill people, as has happened tragically in Donora, London, the Meuse Valley, etc., and may also be happening daily through lung cancer. Hence many cities have asserted control over their air, and the most afflicted ones, Los Angeles County, Pittsburgh, and St. Louis, have done much about it. But still they have not embarked on *invention*, which we showed is ever neglected for inventions not assessable upon their beneficiaries (§ 222,3). It is evident that invention will be most logically and liberally supported, when the whole collection of those who will bene- fit by it, join in paying for and ordering it.

[356] Similarly with water pollution, noise control, fire fighting, crime prevention, and a host of inventions for the safety and health of men, animals, and plants, as we said anent the almost total failure of cities and State governments to create the inventions they need (§ 224-6, 347,8). Unless our Federal Government takes them up, or private enterprise discovers a way to make money from them, in- ventions in such fields remain in the forlorn status of "everybody's business, therefore nobody's business."

[357] *Shallow geophysical prospecting*, i.e., devices like the mine detector to discover objects lost and buried under a few feet of earth, or on the bottom of shallow seas, lakes, and rivers, can have immense value to archeology, history, paleontology, and all the sciences relating to a century or more ago. The most modern lost objects of interest, such as treasure, and buried pipes and wires, are usually of metal, and so can be found by the electromagnetic military invention of the mine detector. But more ancient objects, such as carved stones, charcoal,