of superheated vapor which flays the flesh from men's bones in a boiler-room catastrophe.

Here, the glass-clear gaseous water is sweeping up in volume enough to cloud a planet's atmosphere. The naked wound on the seabed glows white-hot through the wall of the frightful cylinder which encloses it. But inch by inch and foot by foot the waters sweeping in win. The column of steam still rushes up to the ionosphere, still spreads out across the heavens, but it steadily contracts. Beyond the rim of the inferno, crustal rifts are already exuding sills of lava across the ocean floor. Convulsions and seisms mount in cataclysmic fury surpassing the power of any natural quake.

All the waters of the oceans are set in oscillation. A mere volcanic eruption in the 1880s achieved this. Gigantic blast waves are ripping out far away from the crater. Dwindling in strength, they will circle the planet half a dozen times or more before they become indetectable. The turning world itself has quivered as it spins. Transfer of momentum will be small in a strike of this power. I'll neglect it.

The exact division of these different energies may not be clear. It will also fail to be of great influence on my argument. First let us consider certain thermal effects of the strike.

Remember that the meteorite delivers about 3×10^5 calories per gram: just under 10^{22} calories in all.

I take it that energy dissipated in deep Earth tremors, splashed back to space by the plasma jet, or radiated back to space from the impact flare and the fireball, is compensated by the heat gained from the magma bared by crustal damage.

The energy absorbed in massive displacement of ocean water, in tidal waves, in blast, and in local damage to the seabed, will in the end degrade to heat. This will occur soon enough for the heat to give direct backing to the impact flare; it will work immediately behind the flare in evaporating the ocean. The continuity here is, as it were, measured on a *climatic* time scale. The watch dial is calibrated in hours and days, not the split seconds appropriate to the impact.

This being so, every unit weight of the meteorite will cause the evaporation of about 600 units weight of the ocean. It takes about 600 calories to evaporate a gram of water, on average. Not merely to raise it to boiling point, but to turn the whole gram into vapor. You need over five times more heat

to free the molecules from the forces which bind them together in the liquid state than to raise ice to the boiling point. But the evaporation can take place *without* raising the water's temperature at all; as when the ocean turns into rain clouds. My figure of 600 calories averages the heat transfer in the two cases, both of which will occur in our meteorite incident. The calculation runs like this: 3×10^5 calories heat available per gram of meteorite$\div$600 calories to evaporate one gram of water$=$500 grams of water evaporated.

But every cubic centimeter of our meteorite weighs as much as eight cubic centimeters of water. This means that 4,000 *volumes* of water will be evaporated by each unit volume of meteorite. *The four cubic kilometer volume of Vredevoort Mark II will evaporate 16,000 cubic kilometers of ocean.* This is about 3,800 cubic miles!

You will obviously refuse to believe these figures, so let's check the calculations by another route. The total heat equivalent of the strike energy is 10^{22} calories. Dividing this by 600 calories per cubic centimeter evaporated, we get 1.6×10^{19} cc.—16,000 cubic kilometers again. Now normal evaporation from all the oceans of the Earth by the sun's heat is just *under* a cubic kilometer per minute—rather less than a billion metric tons; sixty cubic kilometers per hour.

The meteorite equals the sun's work as a cloud maker for $16{,}000\div60=266$ hours, just over eleven days. This is just enough to provide an average rainfall of over one and a quarter inches upon the whole Earth, oceans and land together.

By itself, this would be a foul enough stormfall. Of course, in the nature of things, the rainfall would be anything but evenly distributed. You can make your own guesses at where the peak precipitations would occur and what their value would be. But the matter would be very far from closed by a single deluge of rain spreading across the planet.

When water vapor turns into rain, all those calories which were used in evaporating it are released to go to work elsewhere. This is the energy cycle which keeps a hurricane spinning; this is the force which lifts the cu-nim thunderhead higher than Everest. *For a while* the latent heat of evaporation is employed in moving air—wind-making.

Choose your own velocities for the winds generated by meteorite rainstorms. But don't imagine they will be gentle