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TOWN PHYSICS

The mass of the citizens as a whole is the sum of the masses of the individual citizens, sometimes referred to as “the full weight of the public”. This may be “thrown” collectively or individually, as in “they threw their weight”, “he threw his weight” etc.

The effect of the weight of a citizen is to continuously and uniformly accelerate his fall.

The bodies of the citizens differ in weight, but under ideal conditions, their acceleration is the same.

All citizens are terrestrially transported at uniform speed.

All citizens meet with equal and opposite reaction.

When two citizens collide, whether they be equally deformed or one only slightly and the other considerably deformed in the collision, the force which each exerts on the other across the surface of contact at any instant is the same.

The mass of a citizen is proportional to his weight, but not his bulk to his density. Some citizens are denser than others. Some citizens are bulkier than others. A bulky citizen of high density constitutes the mass. He has inertia.

All citizens have the quality of inertia, whereby every citizen, so far as he depends on himself, perseveres in his state, either of rest or of uniform motion in a straight line.

Every citizen perseveres in his state of rest or of uniform motion in a straight line except in so far as he is compelled to change that state by actions which, when exerted on his body, tend to change his state either of rest or of uniform motion in a straight line.

When the “composite entity” consisting of a large number of permanently associated citizens has taken on the more familiar aspect of a solid body of well-defined size and shape (which does not deny that constituent citizens may be still in small-amplitude motion within it) we have an object such that the centre of mass of its constituent citizens is a permanently identifiable point (often surmounted by a flag-pole).

Viewed as a whole, the transverse activity of all citizens is zero, otherwise the town would move sideways.

Viewed as a whole, the rotatory motion of all citizens is zero, otherwise the town would rotate.

Viewed as a whole, the vertical movement of all citizens is zero, otherwise the town would rise or fall.

Citizens are elastic, for if citizens are subjected to a stress and thereby displaced from their equilibrium positions the interpersonal forces will tend to restore them to their original positions. If the displacements are not too large, when the stress is removed the citizens (under ideal conditions) will return to exactly the same situation as before.

If all citizens were attracted to each other, they would coalesce at one point. Since this is not the case, it is clear that repulsive forces must operate.

A common meeting-point of citizens occurs at each corner of a street, and can be in three planes, as of citizens approaching on intersecting streets or citizens rising upwards as out of manholes or descending as by pole or parachute. The measure of the solid angle enclosed by these three planes is a measure of the "openness" of the place at which the citizens meet; from which point of view, all citizens meet at an angle, or, since this solid angle is also the apex of a cone, we may say that all citizens meet at the apex of a cone. If the cone is viewed as on its base, any citizen at its apex will be prominent, hence the concept "prominent citizen".

When the meeting of citizens at a certain point continues, with a net gain of arriving over leaving, then "packing" occurs. This may issue in a movement upwards, as in simple climbing of poles and other fixtures, or in the erection of a tall building. The attractive forces between bodies play little part in influencing packing: the packing is almost entirely determined by repulsive forces; that is, the citizens behave very much like hard spheres packed as close as their repulsive forces allow. Their repulsiveness increases with their density. This phenomenon could be studied by coating citizens with white paint. Thus, after breaking open the "pack", the number of contacts could be clearly determined. In this way, the capacity of citizens to "make contact" could be given precise expression.

However, in any "packing", some local motion of individual citizens occurs. We see citizens continuously changing the number of nearest neighbours, continuously shifting and shuffling around, and occasionally we are able to follow a citizen as he squeezes his way between neighbours without leaving a vacant hole.

If an assembly of citizens in a closed container, such as a hall, becomes heated, tempers rise and one citizen will begin to oscillate relative to another. At first, the oscillation is vertical, "jumping up and down on the spot". Then, with increased temperature, transverse oscillations occur. "Stand back!" someone cries. Free energy increases and expansion occurs. Some citizens are pressed to the walls. Others are subject to contractions in certain directions and they

endeavour to expand against these. At higher temperature, melting occurs, firstly as individuals grow livid, then by a collision process in which heat is transported from the colder to the hotter regions. The body of citizens begins to "flow" and it takes up the shape of the containing vessel, filling odd corners and niches of the hall, under tables, chairs, behind curtains, counters, etc. The situation becomes volatile, pockets of vapour and gas appear. The situation becomes explosive. If, at this point, the doors burst open, citizens flow into the night air, where, upon cooling, they return to their normal solid state.

In the light of the foregoing, it is desirable, in the ideal physical dimensioning of a town, that the citizens be of identical mass " m " and have zero size, hence not collide with each other nor exert force on each other, and that their freedom of movement be assured by their collisions with the walls of the town being perfectly elastic.