

An Account of the Speaking Trumpet, as it hath been contrived and published by Sir Sam. Moreland Knight and Baronet; together with its Uses both at Sea and Land. Printed at London An. 1671.

THe Author of this Instrument relateth *first* the several Tryals made with it; of which the most considerable was, that the biggest of those that have been as yet employ'd, turn'd Trumpet-wise, being 5 foot 6 inches long, and of 21 inches diameter at the great end, and 2 inches at the little; When by his Majesties special command it was tryed more than once at Deal Cattle by the Governour thereof, the voice was plainly heard off at Sea, as far as the Kings Ship's usually Ride, which is within two and three miles, at a time, when the wind blew from the shore.

Next, He discourseth of the Nature of Sounds, and the Manner, How he conceiveth them to be magnified or multiplied by this Organ. Where he observeth, 1. That a small Tube (*e.g.* that of an ordinary Trumpet) does not at all magnifie Sounds, Words, or Syllables. 2. That 'tis necessary, the diameter of the least end of one of these Instruments be equal to (if not greater than) the diameter of the orifice of the Speakers mouth, and that what it wants of that, so much the less does the Instrument magnifie the Voice. 3. That the Instrument must be enlarged by degrees, and not too suddenly. 4. That the Mouth-piece of it must be so applyed and adapted to the Speakers mouth, that no Air or Breath be lost, and yet the Mouth have free liberty of opening and shutting, that so the Articulation be entirely preserv'd. 5. That the Point, where the voice is most magnified, is the Center of its greater Orifice. 6. That the turning and winding of this Instrument, either Trumpet-wise, or in any other Circular figure, is so far from prejudicing it, that it the rather strengthens the voice. 7. That (as he with submission conceives) the Voice, as it is transmitted through this Instrument from the Mouth, endeavors all the way to spread and dilate it self by Spherical Undulations; but
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finding Opposition on every side, maketh a percussion in every point of each imaginary circle of the Tube; and again, that the percussion made in every such Circle, being reundulated to the Center of each of them, maketh there a much stronger percussion than that which was made in any single point or part of such Circle, forasmuch as it may be presumed, that all the percussions, made in any of those Circles, are united in their several Centers; and that the percussion in the Center would again dilate it self by a Spherical Undulation, but meeting with opposition in every point of the Tube, an entire Cone of imaginary rays of Sound are reverberated to some Center, in like manner as the Sun-beams are reverberated from a polished superficies of a *parabolical* Concave to its proper *focus*. And that therefore, as the Tube enlarges it self, and the Circles both of Reundulation and Reverberation become greater, there must needs be imagined (according to him) a greater number of Reundulating Circles and Reverberating Rays, to meet in each respective Center and *Focus*, whereby the same voice is greatly augmented. 8. As to the Demonstrative part of this Tube, and the exact Figure and Dimensions of it, he proposeth to Mathematical Philosophers this Problem, *viz.*

What is the Right-lined, Curvi-lined, or Mixt Figure; and what are its exact Dimensions; and what the Sphere of its activity, that best and most magnifies Human Voyce?

Lastly, He subjoins the Uses of this Instrument; as, 1. *That* in a Storm, or in a Dark night, when two Ships dare not come so near one another as to be heard by any ordinary voice, by this Tube they may very easily speak together at half a mile or a miles distance, or more, if need be, especially if alternately they take the advantage of the Wind: And if that be so strong, that but one of the Ships can speak with the Wind, the other may answer by signs, though directly against it. 2. In a Storm it is of good use in a single Ship, for hearing one Man giving order to all in a Ship. 3. By it an Admiral may in a Calm give immediate Orders to his whole Fleet; as also a Governour may convey his Orders from a

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Sea-Fort to Ships riding at a pretty distance in the Road. 4. In case of a close Siege, by this Instrument, at one, two, or three miles distance, the *Besieged* may be told, by speaking in *Cypher*, that there is Relief coming, and how great, and when: And, on the other side, the *Besiegers* may thereby threaten and discourage the *Besieged*, in a spacious Town. 5. By this means a General may speak himself to his whole Army; an Herald may make a proclamation, to be distinctly heard by many thousands; an Overseer of Works, give orders to many hundreds of Workmen, without changing his station; Officers and others, in case of a great Fire, where usually people are in an hurry, may so govern the Assistants as to prevent disorder and confusion; House-keepers, in case of Thieves attacking an House remote from Neighbours, may immediately call upon all the Dwellers round about, within a mile or more, and inform them of the House where the robbery is made, the number of the Thieves, how dressed and armed, and which way they are gone, &c.

The Author doubts not but this Invention may be much improved: But, as to his *Probleme* above-expressed, it seems, to us, that that must be settled by Experience (rather than Demonstrations,) there being a complication of so many *physical* Accidents, that the neglect of some one Un-heeded, may soon defeat a demonstration, deduced from some other of them.