

We begin our account of the Secondary Mechanical Sciences with Acoustics, because the progress towards right theoretical views, was, in fact, made much earlier in the science of Sound, than in those of Light and of Heat; and also, because a clear comprehension of the theory to which we are led in this case, is the best preparation for the difficulties (by no means inconsiderable) of the reasonings of theorists on the other subjects.

CHAPTER I.

PRELUDE TO THE SOLUTION OF PROBLEMS IN ACOUSTICS.

IN some measure the true theory of sound was guessed by very early speculators on the subject; though undoubtedly conceived in a very vague and wavering manner. That sound is caused by some motion of the sounding body, and conveyed by some motion of the air to the ear, is an opinion which we trace to the earliest times of physical philosophy. We may take Aristotle as the best expounder of this stage of opinion. In his *Treatise On Sound and Hearing*, he says, "Sound takes place when bodies strike the air, not by the air having a *form* impressed upon it (*σχηματιζόμενον*), as some think, but by its being moved in a corresponding manner; (probably he means in a manner corresponding to the impulse;) the air being contracted, and expanded, and overtaken, and again struck by the impulses of the breath and of the strings. For when the breath falls upon and strikes the air which is next it, the air is carried forwards with an impetus, and that which is contiguous to the first is carried onwards; so that the same voice spreads every way as far as the motion of the air takes place."

As is the case with all such specimens of ancient physics, different persons would find in such a statement very different measures of truth and distinctness. The admirers of antiquity might easily, by pressing the language closely, and using the light of modern discovery, detect in this passage an exact account of the production and propagation of sound: while others might maintain that in Aristotle's own mind, there were only vague notions, and verbal generalizations. This