

Lecture on motion —

Analysis. —

Intro. Subject important & interesting.

1. There is nothing we know of absolutely at rest in the universe.
1. Name and define certain varieties of motion.
 Uniform - Doubtful if there can be long continued absolutely uniform motion - other rectilinear or curvilinear. —
 Uniformly Accelerated & retarded motion.
 Uniformly
^{Motion is resistless media.}
 Rotatory motion. Rhythmic motion.
 All sorts of rotatory - vibratory - & undulatory motion. — Where the same motions are constantly repeated in equal intervals of time..
2. Motion has no independent existence.
 There must be something moved.. —
 The nearest approach to abstract motion is the propagating motion of waves - of water - of sound - of light.
 — When we speak of sound moving at the rate of 1000 fms/sec
 { there is no material thing moving at that rate but simply a disturbance in the particles of air is propagated at that rate.
3. The motions of large masses of matter are very familiar to us all, & we think we know a good deal about such motions - but it often is the case that the more we examine the subject, & we find out, that the time we know but little about it.. — We will find comparative rest, where we thought there was motion - there there was rest - &c. &c. —

4. Let us regard motion as it is often spoken of, as fast or slow.

These terms relative - Illustrate - Locomotive

How we may regard it as moving fast & how slow.

A Watch hour hand - example of a slow motion.

- Sinking of the oil in the lamp.

Upheaval of crust of the earth - a fast motion in Cos. Planetary motions.

Apparently slow, - really fast.

Even light may be regarded as moving slowly. ▽

5. We have no innate sense of motion -

Motion is change of place - when we see bodies in different places at different times, ~~in many cases~~ we know that there has been motion - or we actually see a change taking place - in very many cases we do not know, which body has moved, or whether the observer has moved or whether all have moved.

Illustrate from the motions of the biamables.

Illustrate for deceptions in motion of cars or canal boats.

5. The coexistence of motions.

Moon + sun + planets - - The earth - music in art:

As many motions as faces - each face must produce its full amount of effect.

But a point can only move in one line at the same time -

Illustrate what is meant by coexistence of motion.

1. We notice each one by itself.

a person walking N.W.

A bell suspended in a locomotive.

Illustrate with gyroscope. —

6. Present now some experimental illustrations of some of these motions - rhythmic particulars. —

1. Gyroscope illustrates coexistence of rotary motion.

2 Simple pendulum. Pendulum on gyroscope

3 Resultant effects of two motions. Pendulums of different lengths vibrating in different times. $T^2 \propto L$.

Make figures for $2^{\circ} 5^{\circ} 7^{\circ}$. —

7⁷ Waves - & we have mentioned in what is called the motion of the wave propagates - it is only the form which moves. & the disturbance is propagated. We hear by the propagation of this disturbance, by indefinite small motions of the air - transmitted through the air. Something like the transmission through a series of ivory walls. Exhibit - as the impact ^{is direct} is not as perfect the result is not as perfect. —

5. Two receivers with parchment & connecting tube. to illustrate propagation of wave motion.

6. Music is the result of rapid vibratory movement.

Savants wheel - Book cover.

7. Diaphasons.

	Holes	8	10	12	16
Time	4.	5	6	7.	$\frac{3}{4}$
Dome	4	5	6		
Sub.	4	5	6		

8 Organ pipes -

9 Siren.

Show to show the difference of tones

* 10. Lantern (Whistle). Undulations on cracked glass. made with tuning fork. —

11. Series of wave apparatus

12. Crystallization - Uranine or Galvanic decomposition
(voltage cells - ?)

~~Chromatograph. —~~

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Light waves - Remarks on.

Heat waves -

13 Illustrate by Radiometer. -

14 Chromatope. -