

**For the Scientific American.
Animal Mechanism.**

At the knee where the motion is backwards and forwards in the same plane, there is a hinge, mortice and tenon joint, more accurately defined by the Great Architect than any that comes out of the hands of the most ingenious carpenter. At the hip there is a mortice and tenon joint of a peculiar form. There is a socket and a ball so that not only for walking is it most beautifully and skilfully adapted, but the limbs can be extended in a different direction with the greatest facility. Mountebanks have skilfully availed themselves of the adaptedness of this joint to this purpose, and have made whole theatres stare at their wonderful agility and suppleness, whereby they have thrown their limbs on a horizontal line with the plane of their bodies.

In machinery we use oil and other lubricating material and construct anti-friction wheels to make shafts and other pieces of mechanism run with ease and smoothness, but the Great Mechanic has furnished our bodies with a supply of the most refined lubricating material for our joints and applied it by a most masterly contrivance. To our joints there is supplied regularly a mucilage more slippery than oil which wonderfully diminishes the effect of attrition. For this purpose glands are fixed near each joint for feeding the cavities with this distilled mucilage, and the glands hanging like loose fringes within the cavities the oil is continually oozing out from them to lessen the friction. Friction wheels in machinery are made in imitation of this but the animal manifests a decided superiority over the merely artificially mechanical. The fine polish on the surface of the bones which compose our joints cannot be equalled by the most skilful artist, and the lubricating material which is continually dropped into them is supplied in proportion to the amount required as the ducts give out the mucilage as they pressed, more or less, by the action of the joints. It would be well for every mechanic to study Anatomy, at least the great outlines of the science. From a study of the arrangement of the different parts of the animal economy, many surgeons have become the most skilful and ingenious mechanics. Dr. Anderson, the inventor of the *Flying Artillery*, was one of the most ingenious of mechanics, and there is not a single surgeon but is very skilful, in fact has to be, and neat in constructing and arranging various machines.

PHYSICIAN.

Trituration Phenomena.

If any coarse and dry substance is triturated by itself, it will continue to be permanently divided and subdivided to a certain but limited extent—for beyond that, the blow would either leave the parts so near each other that they would instantly reunite by the power of the cohesive forces and again become *one solid body*, or would drive these newly separated parts against others or each other, and effect their union by bringing them within the sphere of cohesion. This principle is illustrated by the example of the flint stone,—if pulverized in a mortar, it would at length become so fine that some of the finest of these invisible flint stones would, after any farther division, be soon reunited. All that would be necessary for their reunion and the restoration of their previous hardness would be to bring the parts or their mutually attractive poles so near as to touch each other as before their separation, for the strength of their cohesion depends on the degree of their proximity.—The approximation and union of some of these smaller than microscopic pebbles would be promoted by the pressure of the pestle; the same blows that severed some would unite others—so that the average size of the parts would remain unchanged.—*Dr. Joslin.*

[It is a well known fact, which we have experienced frequently, that after having pounded some hard substance in a mortar until it was so fine that no grit could be felt when pressed between the fingers, that a heavy blow with the pestle would make this *fine substance* become perfectly hard, just as Dr. Joslin has represented. Indigo for example, is a good substance to test the truth of this statement.

Insects are found in slate and flies in amber.

Velocity.

The velocity of motion is estimated by the time employed in moving over a certain space or by the space moved over in a certain time. The less the time and the greater the space passed over in that time, the greater is the velocity. Thus the space and time being given, to find the velocity divide the space by the time. The time and velocity being given, to find the space multiply the velocity by the time.

The uniform velocity of sound compared with the instantaneous motion of light enables us to determine the distance of the object from which the sound proceeds; as that of a cannon fired at a distance, or a thunder cloud, provided we can see the flash and hear the report. Multiply 1130 by the number of seconds between the flash and report—the product will be the distance in feet. Divide the number of seconds by 4.5, and the quotient will be the miles, nearly.

Sound conveyed by means of water, mercury or spirits of wine, moves 4900 feet in a second; conveyed by tin, 7500; by silver, 9300; by brass, 11,500; by copper, 12,000; by iron or glass, 17,500, and by wood, from 11,000 to 12,000 feet in a second. According to the experiments of Sauveur, the lowest sound which the ear can appreciate consists of 12½ undulations in a second, and the most acute of something more than 6000.

Color of Snow.

It has been found that the colors of bodies depend very much, if not entirely upon the arrangement of their particles by which they reflect this or that kind of rays of light. Some experiments of Dr. Brewster of Edinburgh, prove this. He took a piece of polished steel and by beating it to a different degree of temperature, different colors are exhibited and by making slight cuts on its surface, some of them curved or waved &c., he also was enabled to exhibit different colors in consequence of the light being reflected at different angles and of course different rays striking the eye. In regard to the color of snow, we believe that in our latitude it is of a brilliant white color. But in higher latitudes it has been seen of a red color. This at first astonished Parry and his companions, who discovered it in the arctic regions. After a close examination it was found that the red color was occasioned by a foreign substance mingled with it, and which, on further examination, was found to be a very minute vegetable, something like some of the mosses or mould. Indeed, it might with propriety be said to be mouldy snow.

Capt. Parry observes that the arctic mountains, on which he observed the red snow, are about six hundred feet high, and extended eight miles in length. The depth to which the color penetrated has been variously stated by different observers. Some found that it descended many feet beneath the surface, while others never ascertained that it spread beyond one or two inches.

There is no reason to suppose says he, that the coloring matter itself as well as the snow, is a meteorological product, although Humboldt certainly mentions a shower of red hail which fell at Paramo, in South America.

A Beautiful Moral.

A boy, on perceiving a butterfly, was so smitten with its gaudy colors, that he pursued it from flower to flower with indefatigable zeal; at first he attempted to surprise it among the leaves of a rose; then he endeavored to cover it with his hat, as it was feeding on a daisy; now he hoped to secure it as it revelled on a sprig of myrtle; and now grew sure of his prize on perceiving it to loiter on a bed of violets; but the fickle butterfly still eluded his attempts. At last, observing it half buried in the cup of a tulip rushed forward, and snatching at the object of his pursuit with violence, it was crushed to pieces. The dying insect perceiving the boy chagrined at his disappointment, addressed him with the utmost calmness in the following words:

“Behold now the end of thy unprofitable solicitude, and learn for the benefit of thy future life, that pleasure like a painted butterfly, may serve to amuse thee in the pursuit but if embraced with too much ardor, will perish in thy grasp.”

Divisibility.

Divisibility renders a body capable of being divided, either by actual separation of its particles, or by some imaginary dividing time. Dr. Keill has computed the magnitude of a particle of assafœtida, to be only 38 trillionths of a cubic inch. For the purpose of forming its web, the spider has a most curious spinning machine. It consists of four little knobs or spinners, enclosed by a ring and pierced with a multitude of holes, so numerous and so extremely fine, that there are above a thousand in each of these four divisions, a space itself not bigger than the point of a pin. From every one of the holes a thread proceeds so that the very finest part of a web which we can see is not a single line, but a cord, composed of four thousand strands as a rope-maker would call them.

Wool may be spun so fine that a quantity weighing only one grain may be divided into eighty thousand parts each visible to the naked eye. Certain microscopic animals have been discovered in various substances so minute that many thousands taken together, are less than the point of a needle. A grain of musk will fill a large room with a very strong scent, without losing a millionth part of its weight. Whence it is calculated that a single grain is actually divisible into more than six trillionths of parts. A grain of gold can be beaten so thin and spread so large as to admit of being divided into fifty millions of parts, each of which may be distinctly seen with the help of a microscope.

Excavations in Pompeii.

The political state of Italy has lately been engrossing so much attention, that little time has been found for its antiquarian. Since the discovery of the 47 gold coins, and 250 silver coins, together with gemmed ear-rings a dwelling house has been excavated near della Fortuna, which surpasses in richness and elegance all that has before been discovered. The open vestibule, is paved with mosaics, and the walls decorated with tasteful paintings. The Atrium opens into the tablinum and the reception room, and the latter leads into the dining room, which is painted with mythological subjects the size of life; Here were several triclinic couches, not unlike our modern sofas, richly ornamented with silver. The reception room looks into a garden with a beautiful fountain, adorned with numerous mosaics, and a small statue of Silenus; the basin is surrounded with the most exquisite sculptures in marble. Adjoining the dwelling is another four wheeled carriage, with iron wheels and many bronze ornaments. In the kitchen also are ornaments and utensils of bronze, and the traces of smoke are visible in many places, after the lapse of 18 centuries. The apartments of the dwelling house contained numerous elegant utensils of gold and silver, vases, candelabra, bronze coins, several cases of surgical instruments, &c. What is extremely rare is, that there is a second and even a third story, which are ascended by a wide flight of stairs. On a small painting near the staircase is the name and rank of the owner, in scarcely legible characters! and from which it appears that he was one of the Decurion, or Senators of Pompeii. All the walls and the rooms are ornamented with comic and tragic paintings, one of which represents a young girl with a matk and a flagolet. Hence the house has received the name of *casa della Sonatrice*, or *casa del' Ercole ubbrucio*.

Extraordinary.

Recently, the men employed in opening a new colliery at Northup, near Hawarden, Flintshire, Eng, brought up a piece of solid coal. It happened to get broken when a shell was discovered inside containing a live caterpillar. We understand that this extraordinary reptile remained alive for two days after it was rescued from the prison in which it had been confined from the time when the coal was overwhelmed and buried in the bowels of the earth. The shell and the remains of the caterpillar have been sent to the museum of the King's College, London. There have been numerous instances of frogs and toads being buried alive in the midst of solid rocks, but this is the only instance that we remember of a caterpillar having been found alive in such a tomb.

The Power of Imagination.

Physiopathy is a faculty of pervading all nature with one's being so as to have a perception, a life, and an agency in all things. A person of such a mind stands and gazes at a tree for instance, till the object becomes all wonderful, and is transfigured into something visionary and ideal. He is amazed what a tree is, how it could, from a little stem, which a worm might crop, rise up into a majestic size, and how it could ramify into such multitudinous extent of boughs, twigs, and leaves. Fancy climbs up from its root like ivy, and twines round and round it, and extends to its remotest roots shoots and trembling foliage. But this is not all; the tree soon becomes to your imagination a conscious being, and looks at you, and communes with you; ideas cluster on each branch, meanings emanate from every twig. Its tallness and size look conscious majesty, roaring in the wind, its movements express tremendous emotion, In sunshine or soft showers, it carries a gay, a tender or a pensive character; it frowns in winter in a gloomy day. If you observe a man of this order; though his body be a small thing, invested completely with a little cloth, he expands his being in a grand circle around him. He feels as if he grew in the grass, and flowers, and groves; as if he stood on yonder distant mountain top, conversing with the clouds, or sublimely sporting among their imagined precipices, caverns and ruins. He flows in that river, chafes in its cascade, smiles in its aqueous flowers, frisks with the fishes. He is sympathetic with every bird, and seems to feel the sentiment that prompts the song of each. This is, in one sense 'inheriting all good things.'

Temperature of the Ocean.

According to Captain Ross's experiments, the zone of mean temperature lies between the parallels of 54 degrees, and 60 degrees of south latitude, not only at the surface, but to as great a depth as the ocean has ever been penetrated. Future trials will in all probability reduce it to narrower limits; its position in the northern hemisphere remains yet to be ascertained. This mean temperature is met with both in the polar circles and in proceeding towards the Equator. In the higher latitudes above 10 degrees, the ocean in descending increases in temperature until it arrives at its mean point; while proceeding towards the Equator it decreases from the surface downward—this decrease, beyond the tropical circle, is about twenty-three fathoms for every degree of latitude, within the tropics it is 1 degree for every thirteen fathoms of depth, until 400 fathoms, after which it requires a descent of from 200 to 400 fathoms to effect a like change.

From the observations of Admiral D'Urville it would appear that the waters of the Mediterranean do not follow the rate of descent of the Atlantic and Pacific Oceans. He estimated the mean temperature of that sea below 200 fathoms, at 65 degrees and this from the fact of having obtained that temperature at the depth of 1,000 fathoms. If this be so, it leads to an interesting inquiry whether this may not be in consequence of the vast internal fires that are known to prevail in the countries that surround it.

Economy.

At the recent Railroad celebration in New Hampshire, a large number who remained in Lebanon, were sadly puzzled to find accommodations over night. A worthy inhabitant of that place, declares that such was the rush, that, in one instance, there was but one bed for fifty persons! In this dilemma, the following expedient was adopted:—“Two persons took possession of the bed, and being much fatigued, were soon sound asleep, they were then carefully removed, and set up against the wall. This process was repeated till the whole fifty were disposed of.”

A Deep Crime.

If there is one crime more deep than another, it lies at the door of him who corrupts the morals of another perhaps a young and confiding friend. He is sowing, broad-cast seeds that may devour the constitution, and destroy the happiness of millions yet unborn. The doom of such cannot fall short of the “blackness of darkness” forever and ever.