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Contents:

(Illustrated articles are marked with an asterisk.)

MUSCULAR MOVEMENT WITHOUT LIFE.

"We find no motion in the dead," says the first of Tennyson's "Two Voices," clinching his argument as with an axiom. The converse of the proposition, that where there is motion there must be life, is equally an article of popular belief. Especially is conscious life inferred when the motion imitates voluntary movements. A coffin, for instance, is opened for a last look at the features of a dead friend before the remains are removed from the receiving vault to the grave, and the body is found completely turned over: or the hands, no longer crossed upon the breast, expressing "long disquiet merged in rest," are so displaced as to give unmistakable proof of continued motion. The thought that life must have directed such movements adds to the pangs of bereavement the keenest regret and anguish; and too frequently the mourner has borne away a self inflicted brand of Cain. The idea of returning consciousness and a second death within the coffin in consequence of too hasty burial is too horrible to contemplate; and the faintest suspicion that one has been the cause of such a dreadful fate to another is full of unutterable bitterness.

To those afflicted in this way, and those who fear such a fate for themselves, it must be a consolation to know that muscular movements are by no means valid evidence of life. We do find motion in the dead. Indeed, for one class of muscular actions, at least, arrest of motion seems to be rather an accidental than a necessary attendant of death.

The persistence of motion in decapitated snakes, turtles, and other low forms of life is familiar to every one. It is commonly explained by the relatively large nervous ganglia, independent of the brain, of such creatures. But it appears that many if not all muscles may contract without that stimulus of nervous action, with which alone we associate the possibility of conscious life. A striking illustration is given by Dr. Brown-Séquard in the case of two decapitated men. The arms were cut off; and for thirteen or fourteen hours, their muscles contracted in response to irritation by galvanism or mechanical stimulants. After that length of time, all signs of life had disappeared. He then injected the blood of a man into one of the arms and the blood of a dog into another. Local life was restored in both; the muscles became irritable, and the strength of contraction, extremely powerful. In the arm in which human blood had been injected, the contraction was stronger than during life; yet the nerves remained quite dead.

On another occasion the same observer kept the eye of an eel, removed from the body, at a temperature of about 36° to 40° Fah., for a period of sixteen days. By that time the eye was in almost complete putrefaction, yet the iris contracted when exposed to light. Nervous action was impossible, and muscular fibers themselves were considerably altered; yet they acted.

It is in connection with the rhythmical movements of the heart and other organs, however, that the most striking proofs of muscular action independent of the nerve centers, are found. The diaphragm, for example, may be separated completely from the spinal chord without interruption of its rythmic action. Similarly the heart of a dog has continued to beat for forty-eight hours after its removal from the animal, and there is recorded the case of a man at Rouen whose heart was found to beat for thirty-six hours after the death of the body by decapitation. "I dare say," observes Dr. Brown-Séquard, "that the great cause why we see those organs stop at death so quickly is that the phenomena of arrest of their activity have taken place at the time of death," the phenomena of arrest, we may add, being quite independent of the cessation of life. Other observers have demonstrated the rhythmic action of numerous other organs in man and the lower animals: motions that persist after, not death merely, but the entire separation of the parts from the rest of the body. Indeed Dr. Brown-Séquard claims to have found that rhythmical motion is a common property of all contractile tissues, but one which shows itself only under certain conditions, different from the ordinary circumstances of life.

Still more remarkable is the fact that motions closely mimicking voluntary movements can go on in the absence of conscious life.

Dr. Séquard mentions a case in which he was called to see a man who was thoroughly dead of cholera, yet who persisted in certain complicated movements distressingly suggestive of life. The dead man would lift up his two arms at full length above his face, knit the fingers together as in the attitude of prayer, then drop the arms again and separate them. These movements were repeated many times, with decreasing force, until at last they ceased. To persons not knowing what may take place in the human body after death, these singular movements, observes the Doctor, must certainly have looked as if the will power had been directing them. In fact the family and friends all thought the dead man alive, and many tests had to be applied to convince them that death had really taken place.

It is worthy of notice in this connection that it is generally with the victims of cholera and other sudden and violent diseases that *post mortem* movements are most common, and consequently the suspicion of premature burial most likely to arise. That such movements are wholly independent of life was demonstrated beyond a doubt by Dr. Dowler, of New Orleans, who adapted the heroic expedient of cutting off the limbs of patients, dead beyond hope of recovery from cholera and yellow fever. Notwithstanding their separations from the nervous center, the amputated limbs continued their seemingly voluntary movements. Whatever may have caused them, it is evident that these imitations of life were not due to anything that could be associated with concsiousness.

DISCOVERY OF THE CAUSE OF THE ZODIACAL LIGHT.

Professor Arthur W. Wright, of Yale College, communicates to the *American Journal of Science and Arts* a valuable paper on "The Polarization of the Zodiacal Light," in which the experiments of the investigator are detailed, and results given which will probably set at rest the moot question as to the nature of that celestial phenomenon. The zodiacal light is a faint nebulous radiance, which, at certain seasons of the year, and especially within the tropics, is seen at the west after twilight is ended, or in the east before it has begun. The luminosity is conical in shape, the breadth of the base varying from 8° to 30° in angular magnitude, and the apex being sometimes more than 90° in rear of or in advance of the sun. To account for this appearance, several theories have been advanced. Cassini believed it a lenticular solar emanation; Kepler considered it the sun's atmosphere, and Maeran, a reflection from the latter stretched out into a flattened spheroid. Laplace declared the phenomenon to be a nebulous, rotating ring, situated somewhere between the orbits of Venus and Mercury; and Chaplain Jones, U.S.N., whose examinations into the subject have been the most extensive on record, also believed it a nebulous ring, but continuous, and not located as stated by Laplace. Professor Wright's deductions, as will be seen, fail to agree exactly with any of these views.

But few attempts, it appears, have ever been made to determine whether or not any portion of the light is polarized, and up to the present time, knowledge on the subject has been uncertain and contradictory, pointing either to the idea that the rays are not polarized at all, or that the proportion of polarized light is so small as to render it nearly impossible to be detected. Professor Wright, becoming convinced that the difficulty should be ascribed to the imperfections of the instruments employed, constructed a new apparatus, consisting of a quartz plate, cut perpendicularly to the axis and exhibiting, by polarized light, an unusual intensity of color. It is a macle, the body of the plate consisting of left handed quartz, through which passes eccentrically a band of right handed quartz, bounded by two intermediate strips of different structure. Placed between two Nicols, these strips appeared as bands of color, upon dark or light ground according to the turning of the prisms. This plate, mounted in a tube with a Nicol, formed a polariscope of extraordinary sensibility, and the first favorable opportunity to test its powers on the zodiacal light was improved. It was almost immediately found to indicate the existence of light polarized in a plane passing through the sun; and in no instance, when the sky was clear enough to render the bands visible, did their position, as determined by the observation, fail to agree with what would be required by polarization in the plane above noted. Not the slightest trace of bands was ever seen when the instrument was directed to other portions of the sky. The observations took place on clear, cold nights when the moon was absent. The polarization, it was also proved, did not arise from faint vestiges of twilight, the reflection of the zodiacal light itself in the atmosphere, or from impurities in the latter.

Further experimenting was at once proceeded with to determine the percentage of light polarized, and it gave, as the mean of numerous determinations, the angle 36·6° corresponding to a proportion of 16 per cent; 15 per cent, Professor Wright thinks, may be safely taken as the true value.

The fact of polarization implies that the light is reflected, either wholly or in part, and is thus derived originally from the sun. No bright lines were found in the spectrum, nor could any connection be traced between the zodiacal light and the polar aurora. This is important, as excluding from the possible causes of the light the luminosity of gaseous matter, either spontaneous or due to electrical discharge. Further, it cannot be supposed that the light is reflected from masses of gas or from globules of precipitated vapor, as the latter, in empty space, must evaporate, and the former expand to too low a density to produce any effect on the rays of light. Hence, Professor Wright concludes that the light is reflected from matter in the solid state, from innumerable small bodies revolving about the sun in orbits, of which more lie in the neighborhood of the ecliptic than near any other plane passing through the sun. These meteorites, which are in all probability similar in character to those which fall upon the earth, must be either metallic bodies or stony masses. If we accept Zöllner's conclusion, that the gases of the atmosphere must extend through the solar system, though in an extremely tenuous condition in space, the oxidation of metallic meteoroids would be merely a question of time. They would thus become capable of rendering polarized the light reflected from the plane, and the same effect would be produced by those of stony character. In order to ascertain whether the proportion of polarized light, actually observed, approached in any degree what might be expected from stony or earthy masses of a semi-crystaline character, with a granular structure and surfaces more or less rough, a large number of substances were submitted to examination with a polarimeter; and the results showed that, from surfaces of this nature, the light reflected has in general but a low depth of polarization, not greatly different in average from that of the zodiacal light.

The nature of the phenomenon, as discovered by Professor Wright, may therefore be summarized as follows: It is polarized in a plane passing through the sun, to the amount of about 15 per cent. The spectrum is the same as that of sunlight, except in intensity. Its light is derived from the sun reflected on solid matter, which consists of small bodies revolving about the sun in orbits crowded together toward the ecliptic.

A PROPOSED TESTING LABORATORY.

Professor R. H. Thurston, of the Stevens Institute, has suggested a really excellent idea, which will be of great benefit to the entire country. He proposes, in a letter to the trustees of the above named college, a copy of which we have recently received, to establish a department "to be devoted especially to experimental investigations having a direct and practical bearing upon questions arising in the course of regular business." That is, a testing laboratory is to be organized, to which manufacturers, for instance, may send material which they propose to purchase, and have its value, properties, etc., carefully determined; and where officers of railroads may obtain dynamometric determination of the resistance of trains, efficiency of locomotives, and value of fuel and lubricants; and where iron and steel makers may find a recognized authority which will afford them full and accurate knowledge regarding the chemical constitution, physical structure, etc., of their products. These are but a few of the very manifest uses for which such an establishment could be employed by the business community with the greatest benefit, and we doubt not but that the reader will be able from his individual experience to suggest many others.

It is designed to comprise the most powerful testing machines, the most delicate instruments, and the best forms of apparatus, to be under the direct control of a very able body of scientists. Professor Thurston himself, we notice, volunteers to assume the direction, and to carry out the details of the organization. This is decidedly a case of the right man in the right place, and the trustees of the Stevens Institute, in their ready acceptance of Professor Thurston's views and offers, evidently are impressed with the same belief.

These gentlemen, in their reply, promise to accord all necessary space, and to render every assistance in their power As the originator of the scheme says that there will be no difficulty in securing sufficient capital, from business men to be benefited by it, to purchase the necessary outfit, or even to create such an endowment as would insure the independent support of the laboratory, we may regard the enterprize as an accomplished fact, requiring only the time necessary for its practical establishment to place the community in full possession of its advantages.

HON. DAVID A. WELLS AND THE FRENCH INSTITUTE.

We notice with much gratification the elevation of Hon. David A. Wells to the vacancy in the list of foreign associates of the French Institute, caused by the death of John Stuart Mill. Membership in the Institute is regarded throughout Europe as one of the highest distinctions to be labored for by literary and scientific men, and only a very limited number of persons, who must have become distinguished in science, literature, or art, are admitted to its councils. The honor, in the present instance, is enhanced by the fact of Mr. Wells being chosen as the peer of the great thinker lately deceased; and that it is a well merited one, need not be told to the many who are familiar with his learned and able wri-

tings. The latter have long been held in the greatest esteem by the first political economists in France and England. Of his reports on local taxation, to the legislature of this State, one hundred thousand have been printed in England and distributed throughout Europe. Soon after the German war, the French legislature caused Mr. Wells' report on taxation of 1869 and his New York report of 1870 to be translated and printed as public documents.

FROM CHAOS TO CORAL.

Many of our readers doubtless have noted, perhaps during the study of experimental chemistry, that silver when melted and afterward allowed to solidify in an earthen crucible will, as it cools, assume a brisk effervescence. The mass bubbles and swells; small particles are thrown out of the pot, and, in fact, a miniature volcanic eruption is reproduced: to complete the resemblance to which, the silver, when solid, appears covered with little cones pierced at the center, simulating the form of volcanoes. This phenomenon, however, we can easily account for from the knowledge that gases are absorbed not only by liquids at the ordinary temperature, but by melted bodies. The silver absorbs oxygen, which it abandons on cooling; the more sudden the latter, the greater the disengagement of the gas; while, on the other hand, if the metal be allowed to get cold slowly, the oxygen escapes insensibly and hardly disturbs the surface. Melted litharge also absorbs oxygen, and similarly abandons it. A like absorption takes place in the combustible gases which are found iu the furnaces for melting metals, and recent investigations in France have proved that cast iron after cooling retains a notable quantity of gas, especially of carbonic oxide and hydrogen.

While, however, totally melted bodies absorb gases and reject them at the moment of cooling, the same bodies, when simply softened by the action of heat (though absorbing gases as before), retain the gases after becoming cool, and give them off slowly under the influence of a new elevation of temperature and of an almost perfect vacuum. These facts are not only very curious, but are of considerable importance from a geological point of view.

Volcanoes, it is known, when in eruption emit various gases: first hydrochloric acid, sulphuric acid, and hydrosulphuric acid; later, the carburetted hydrogens predominate; and finally appears a disengagement of carbonic acid, which lasts for centuries. The volcanoes of Auvergne, in France, have been extinct for thousands of years, and yet springs charged with carbonic acid are abundant iu the vicinity. There are other well known instances, such as the celebrated Dog Grotto, near Naples, so called from the practice of lowering unhappy dogs into its depths to see them overcome by the deleterious gas, and the *Guevo Upas* or poisonous valley of Java, where the atmosphere is so deadly that the soil is said to be covered with the bones of animals and of men who have died from its effects: in both of which the discharge of gas has existed from time immemorial. Humboldt counted 407 volcanoes on the earth, of which 225 only were active. This latter number has since been increased to 270, of which 190 are on the islands or shores of the Pacific. The majority of volcanoes are situated near the great fracture which extends along the coast of the American continents, and is prolonged to Kamschatka, to Japan, and as far as Java and Sumatra; others are located in New Zealand, New Britain, the New Hebrides, New Caledonia, and, in the antarctic regions, Mounts Erebus and Terror. The quantity of carbonic acid disengaged by these vast furnaces is enormous. Boussingault estimates it at 95 per cent of their entire gaseous emission, and this has been verified by Bunsen in investigations upon the emission of Mount Hecla. Here then is an immense and apparently inexhaustible series of reservoirs, which forms the source of a large amount of the carbonic acid in the world. It remains to examine how this supply was generated, and the theory which has been proposed is readily followed.

When the earth cooled down from its molten state, the various substances, which were maintained separate by the excessive temperature, became united according to their respective affinities: hydrogen and oxygen formed water; oxygen and carbon, carbonic acid; chlorine aud sodium, sea salt, and so on. The incandescent rocks, however, while still liquid, found themselves in contact with a dense atmosphere containing various gases, which they absorbed in exactly the same manner as we have stated the silver and litharge to act as regards oxygen, and iron, in reference to carbonic oxide and hydrogen. Further, it was possible that these rocks should become charged in a greater degree with carbonic acid than with other gases existing in the atmosphere, through the action of a relative affinity, just as the melted silver absorbs oxygen instead of nitrogen, though both are present iu the same atmosphere. As commotions on the surface of the globe were frequent in its transition state, the rocks were perpetually changing places. Vast masses would be engulfed, to be replaced by others rising from the depths, and so au incredible quantity of carbonic acid became occluded in their substance. As these rocks solidified, the carbonic acid slowly escaped; and if, as is proved, with reasonable probability, there still exists in the interior of our globe an incandescent mass which is constantly cooling, here then is the source of the disengagement of the gas which, escaping through the volcanic apertures, mingles with our atmosphere.

It is curious, in thus tracing the part which the extinct volcanoes play in the economy of our globe, to note how perfectly the migration, which the carbonic acid that they evolve may assume, illustrates the truth of the indestructibility of matter. First found in the primitive atmosphere of our earth, it became absorbed by the incandescent rocks, and remains buried in their depths for thousands of years. Little by little, however, as its captors become colder, it makes its way from its subterranean prison, and escapes into our atmosphere. Its liberty is, however, of short duration, for the rain again seizes it and carries it perhaps to the rivers, and the latter to the sea. From the water it is wrested by lime to form a carbonate, which minute animalculæ—the coral insects, working tirelessly century after century—build first into a reef and then into an island, forming perhaps the nucleus of a new continent, to be completed in the ages far in the future.

ART AMONG THE ASHANTEES.

The thousand ounces of gold gathered in such haste by King Koffee, as the first instalment of the indemnity demanded by his English conquerors, furnish many curious and striking illustrations of the artistic development of the native goldsmiths. Their skill in working gold—which appears to be the most common metal of the country—seems, indeed, to be fully equal to that of the best European artists, while their fertility in invention is simply wonderful.

Among the larger articles brought away by the English is a human head of massive gold, nearly five pounds in weight: a ghastly object, apparently representing the head of a victim gagged for sacrifice. Of a more pleasing character, and more to be preferred as works of art, are two heavy golden griffins, said to have been broken from the King's chair of state. There are besides, many badges of office of different styles, some of them massive fibulæ of wrought gold, like those worn by the heralds sent by King Koffee to treat with the English commander, others of various patterns according to the office of the wearer. That of the King's chamberlain, for example, is distinguished by padlock and keys; the butler's, by cups and bowls, all of solid metal, and, for the most part, castings of exquisite design.

In addition to these great badges, each of which contains many ounces of pure gold, there are fetish caps ornamented with gold in *repoussée* work, the golden tops of umbrellas and sticks of office, grotesque lions for the heads of scepters, golden jaw bones, thigh bones, and skulls, a large sacrificial knife with a golden handle, and many indescribable objects which doubtless served their purpose in the fantastic ceremonies of fetish worship.

Smaller in size but not inferior in workmanship is an infinite number and variety of objects of native design, besides numerous imitations of the gold work of other nations and ages: bracelets, some so heavy as to be a burden, others of exceeding lightness aud delicacy: necklaces, chains, pendants, brooches, and rings of curious yet beautiful shape.

The imitated articles give a striking indication of the skill with which the native workmen copy everything that comes to them from the outer world. Thus there are golden padlocks, buckles, bells, and even watch keys, whose use must have been unknown. Not the least curious are several copies of reliquaries, left, perhaps, by Roman Catholic missionaries in that benighted land, and reproduced in gold by the native workmen, with a faithfulness and delicacy which a Chinese might envy. Among the brooches, pendants, badges, rings, and so on, there are forms which are almost facsimiles of early Indian ornaments; others approach Egyptian styles: still others, Scandinavian and Anglo Saxon types. The whole world, in fact, has been laid under tribute and the relics hoarded in this out-of-the-way region.

Some of the articles are quite new, and still have clinging to them the fine red loam in which they were cast. Others are old and worn, and bear traces of frequent patchings and solderings. One of the most remarkable of the ancient pieces is a finely chased seal ring, the signet being made of an ancient Coptic coin. Two other rings were evidently copied from early English betrothal rings. Some of the necklaces and chains are formed of beautiful shells reproduced in gold, while others represent seeds and fruit. In every case, the design is individual and the beauty of the workmanship refreshing to see, in contrast with the machine-made jewelry worn by modern civilized belles.

The most noteworthy object in silver brought from Ashantee is an enormous belt or baldrick, to be hung over the neck by a massive chain, crossing the breast diagonally. From the belt depend seven or eight silver sheaths for knives, the use of which it is not difficult to imagine.

BURIAL IN THE SEA.

The disposition of our dead is a problem so important that any contribution towards its solution should be welcomed. Ordinary inhumation is manifestly objectionable on sanitary grounds. The pollution of the air we breath and the water we drink is enough to condemn the practice in densely populated countries. The Italian suggestion of casting the bodies into one commou charnel house, hastening decomposition by caustic alkalies, is repulsive; the mingling of the good and the bad, the rich and the poor, offends our moral and social tastes; and then too we fear some one in this utilitarian age would propose, and some agricultural legislature carry out, the idea of using the compost as a fertilizer. The best modification of separate burials in the earth is the use of hydrated oxide of iron to assist the destruction of the body; but even this is not entirely free from the hygienist's objections. In spite of the utmost precautions (which in practice would seldom be carried out), the air and water would be more or less contaminated. The pagan plan of cremation has something in its favor, but much against it. The establishment of furnaces for the conversion of our departed friends into gases and ashes is too infernal to be popular; and we are not so sure that the atmosphere would be any the better for breathing or smelling, should the practice become general.

To those who object to earth burial for the sake of the living, and to the roasting process on other grounds, we now propose a third method, which certainly has the merit of escaping the disadvantages of the other two. We mean burial in the deep sea, which, for the want of a better word, we will call thallataphy. Let a steamer for the purpose—a floating hearse—transport the dead at least a hundred miles from land and commit them to the depths. The coffin, whether of metal or wood, should be perforated with small holes and weighted. Is any one shocked? We doubt if he can tell why. Banish the idea of sharks; they belong to the coast. The deep sea fauna is made up of low and harmless forms of life—sponges, rhizopods, diminutive molluscs, and the like. The dead would never pollute anything of which the living partake. Do you prefer to commit the relics of your departed friends to their "kindred elements?" It is far more appropriate to lay them in the bosom of the ocean than to inter them in the land—dust with dust; for the average man consists of 88 lbs. of water to 66 of solid matter. Nor need any one be troubled about the resurrection; for we are assured that "the sea shall give up its dead." We say then, especially to the great maritime cities like New York and Boston, London and Liverpool, away with patent furnaces and crowded cemeteries, and find rest in the unlimited burial place which Nature has provided. J. O.

REGULATING THE SPEED OF AN ENGINE.

We have received a neat little pamphlet* from the J. C. Hoadley Company, of Lawrence, Mass., giving the results of experiments in regulating the speed of an engine, first by means of a variable cut-off, second, by throttling the steam, controlling mechanism being actuated in each case by the governor. It is scarcely necessary to say that the results are largely in favor of the variable cut-off. It is easy to understand why this should be so.

When a cut-off is employed, steam of nearly the boiler pressure is admitted to the cylinder; and the admission valve being closed before the piston has completed its stroke, only a portion of a cylinder full of steam is used. On the other hand, when the steam is throttled, its pressure is reduced before admission, and a cylinder full of steam is required. In the pamphlet referred to, quite a number of comparisons are given, and statements are made in regard to the amount of coal and water required for horse power per hour in each case. There is no account of the manner in which the experiments were conducted, nor is it stated whether they were made by members of the company or by disinterested experts, both of which facts will tend to lessen their value, in the opinion of many. There is little doubt, however, of the truth of the principal statement, that under ordinary circumstances an engine with a variable cut-off will be more economical than one in which the valve is arranged to cut off at a fixed point, all regulation being effected by throttling the steam.

THE MAGNETIC EQUIVALENT OF HEAT.

There has recently been devised, by M. Cazin, in France, a thermomagnetic differential apparatus, by means of which, it is stated, the absolute quantity of heat engendered by magnetism may be measured; in other words, the magnetic equivalent of heat may by its aid be determined. The investigator, after observing the thermic effects of magnetism on the core of a rectilinear electromagnet, around which the wire is rolled in alternately opposite directions, so as to produce several poles, enunciates the following law: "When the alternate spirals, constructed by the wire, have the same dimensions, and when they divide the magnet into several equal portions (*concamérations*), the quantities of heat created in the iron core at the opening of the voltaic circuit are inversely proportional to the squares of the number of divisions, the other circumstances not changing." For example, four similar bobbins are disposed around a cylindrical iron tube at equal distances apart, the tube extending a short length beyond the outer coils. In establishing the communications, there is obtained, with the same total length of wire and the same total number of points, one, two, or four divisions: the quantities of heat decrease as the numbers, $\frac{1}{4}$, $\frac{1}{16}$.

In order to measure this heat, M. Cazin has constructed a kind of differential air thermometer, in which air reservoirs are used. Two or three thousand interruptions of the electric current produce, with an ordinary battery, a calorific effect very plainly measurable. By dividing the pressure observed by the number of interruptions, and making a small correction analogous to that employed in calorimetry in taking account of the cooling action of adjacent bodies, the thermic effect of the magnetism is obtained.

RECENT BOILER EXPLOSION.—A correspondent in Lexington, Ky., sends us an account of a boiler explosion in that place. Considerable damage was done to the building in which the boiler was situated, and two horses were killed. The boiler was quite old, and the steam gage was very defective, according to our correspondent's statement; so it seems quite probable that the explosion occurred from excessive pressure. A steam gage that shows 45 pounds pressure, when the actual pressure is 100 pounds per square inch, with a so-called safety valve to correspond, and a careless and ignorant man in charge of the boiler, offer very favorable conditions for an explosion.

*Comparative Economy of Regulation, by Variable Cut-Off and by Throttle Valve, as Exemplified by Indicator Diagrams from engines built by the J. C. Hoadley Company, Lawrence, Mass.