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DEATH A UNIVERSAL LAW.

PRESIDENT'S ADDRESS.

DELIVERED BEFORE THE

Michigan State Medical Society.

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LANSING,

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GEORGE E. RANNEY, M. D.,

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Another year, clustered and freighted with precious memories, cherished reminiscences, and honored names, has passed into the pages of recorded time.

We are unpleasantly reminded by a keen sense of personal bereavement, and by the portentous shadows stretching from the west, of an impending anguish, which quickens and intensifies the slumbering and dormant consciousness, and awakens us to a full and comprehensive realization that we are confronted by a deadly and unrelenting foe armed with a mortal sting.

We recall to mind the names of a battalion of distinguished and illustrious men who have joined the silent majority within the last twelve months—the heroes of science, the martyrs of religion, and the giants of literature. The most recent recruits to the viewless world are Lowell, Manning, and Agnew, who are among the greatest representatives of literature, theology, and medicine.

I shall not detain you by a recital of the wonderful strides in progressive medicine and its collateral branches during the year which has now joined those beyond the flood. In gynæcology, surgery, laryngology, mechanical therapeutics and practical medicine, the march of discovery, development, and scientific expansion, has been gratifying in every department, absolutely marvelous in some, and startling, daring, and bewildering in other lines of the profession. I merely allude to these evidences of advancement in our chosen field of labor and investigation.

The yearly review of annual discoveries hitherto made by my honored and distinguished predecessors, I shall leave for the orators and chairmen of the different sections, choosing rather myself to consider some of the phases of the great, irresistible and merciless enemy of mankind, and take a cursory glance at the countless forces in secret cells and in every conceivable form of activity.

The physician, equipped by long experience, panoplied with science, and sustained by a high sense of the great responsibility he assumes in dealing with human life, goes out to battle with the hosts of invisible foes marshalled by the dread destroyer, against the health and happiness of our fellow men.

All that human genius can suggest, all that the combined wisdom of the world, all that science can evolve by synthetic and analytical power, by chemical transformations or by microscopical research, extending through a period of two thousand years of ceaseless and exacting labor and honest toil, with the view of warding off the fatal aim of the winged dart directed at the citadel of life, has been invoked, and yet the great conqueror still marches on to victory. We may oppose its advance, out-flank momentarily, put up barriers, raise obstructions, defer the anguish, postpone the agony, and plead with lotions and sweet oblivious anodynes for delay, but the envenomed and barbed shaft propelled by the grim monarch, robed in solemn white with the insignia of his vocation, pierces the tinsel fabric that we offer as a shield, and the end is death.

Thus we are foiled and stand in the presence and silence of death, utterly vanquished, gazing upon the wreck the victor has

left. The tenantless tabernacle defies all scrutiny, the secret of its change is wrapped within its bosom and its shroud, and intensifies and deepens the mystery of life.

New processes now engage our attention, elemental transformations begin, because there is no such condition as rest in nature; from change to change, we run a ceaseless oscillation and perpetual flight. The atoms that compose a plant or a planet constantly change with irresistible and restless activity, the germs of the acorn are vitalized with active development and life, the leaves of the oak and its swaying branches indicate the palsying touch of blight and death. In the lonely flower blooming unseen upon a mountain cliff, and the giant planet whirling with astounding and startling velocity in boundless space, there is a constant change going on in their molecular constitution, a perpetual building up and aggregation of matter, or a silent and viewless process of disintegration; and decay inscribes its invisible and subtle agency upon them and all material things.

Life and death are contending forces, and imperial and merciless time is the supreme arbiter. Death is a universal law, is coëval with time, and executes his mission and commands with inflexible fidelity. He seizes with fatal and remorseless grasp every form of organic life. Nothing escapes his conquering march, his icy breath, or his insidious invasion. The towering oak and the moaning pine, the proud and haughty monarch on his throne, holding within his grasp the fate and destiny of empires, and the insect of a day, surrender alike to the common enemy, the fell destroyer of all created matter.

Life is a constant struggle against opposing forces, amid an environment of death-dealing agencies.

We are surrounded by the terrific energies and correlative forces of the great destroyer.

In the torrid heat, the fatal beams, vibrating with impetuous zeal and dazzling with the splendors from the throne of light, send their countless thousands of appealing humanity to the silence of the sepulchre.

In the cheerless and unbroken solitude of the north, amid polar snows and perpetual congelation--a wild, desolate and

weird abode of the cruel messenger—there in the pale and flickering light of the midnight sun, death comes to the weary and sleeping victim in noiseless strides, creeps into the slowly throbbing and pulsating breast, freezes up the warm currents of life, stifles his breath with the artistic tracery of frost evolved by struggling life, and the unfortunate awakes no more forever.

All around us in every house he waits in ambush; in the palace of the king and the humble cottage of the peasant, the merciless foe of man, crouched possibly in a few drops of impure water, or in some inviting and alluring food, or in a gas that penetrates the chamber of the sleeping innocent, who unconsciously holds gentle communion with his destroyer.

His emissaries are as the sands of the sea. The countless millions of insects that people the sunbeam and inhabit the air are the active messengers of the pale monarch of the silent realm.

His agents lurk in the air, in every mephitic gas and poisonous vapor. They linger in the vital and life-giving sunbeam, they go hand in hand with life itself, watching for the time and place to poison the fountain or deposit the germ-producing cell, the tubercle, the pulmonary bacillus, or enter by some one of the million avenues to the citadel of life and cut short a brilliant career.

In every house the king of terror has a throne. His retinue of retainers are embraced in sewer gas, decaying vegetables, in neglected cellars, illy-ventilated rooms, decomposing garbage and with scores of other agencies supplying a hot-bed of disease, swarming with remorseless instrumentalities of death.

The feverish flush and pallor of consumption afford daily demonstration of the fierce and desperate conflict that is raging between life and death for the mastery.

The black flag of the great and invincible conqueror is unfurled over an appalling legion of diseases, representing every phase and feature of human misery and suffering, constantly seeking a lodgment in the strong and robust man, as well as in the weak and helpless infant; and as the plainest laws of health are daily violated and constantly disregarded, diseases are invited to an easy victory. And how powerless are we, and how

impotent are the resources of science and the greatest skill, when the half conscious patient feels that the great seals of life are broken, and discerns, by clairvoyant vision, the presence of the arch enemy of his race.

Diseases march from continent to continent and from one hemisphere to another, marshalled in cohorts like the veteran legions of a Roman conqueror.

The disease known as the black death emerged from the dark and pestilent jungles of Africa, bearing upon its death-dealing pinions the poisonous gases from the burning districts which border Egypt on the south, loaded with putrid emanations exhaled from the animal and vegetable substances decomposed in the lakes formed by the retiring waters of the Nile and the cemeteries which its inundation reached.

Sultry winds from the south carrying the condensed vapors and the poisonous gas of thousands of unburied human bodies, decomposing and putrefying in the blazing heat of the torrid sun in a panic-stricken and famine-cursed land, carried fearful mortality, not only in themselves, but by the universal destitution which followed in their train.

Death held high carnival; the jaws of the hideous monster grew weary in their work; the insatiate foe of human life revelled in the temple of aggregated woes, and held court in the dark pavilion of universal grief, and flooded his charnel craft by the tears of desolated homes.

The black death advanced westward through continental Europe, spreading upon every hand calamitous destruction and general consternation, destroying in three years, during the middle of the fourteenth century, 25,000,000 inhabitants. People fled in every direction, as from a drove of wild beasts. Nothing could arrest its march or obstruct its course. Every remedy was found useless, every means to save life proved abortive. A few hours of struggle, suffering, and resistance, and the mystery of mysteries was sullenly triumphant.

It is not my intention or purpose to enter into a historical account of all of the well known scourges of the human race. It is well known that the Asiatic cholera, sometimes called the

plague, in its epidemics, spreading over different parts of the globe from central Asia, swept millions of its victims to the grave.

Yellow fever first made its appearance near Calcutta and the delta of the Ganges, passed westward to Bombay, thence to Mecca, upon the Red Sea. Next it broke out in Alexandria, passed up the Nile to Cairo, and searched in vain for victims amidst the solitudes and ruins of ancient Thebes. It crossed the Mediterranean Sea and lighted its baleful fires under the shadows of the crescent and the cross. From Constantinople it swept through the Grecian Archipelago and shrouded Athens with the trappings of universal grief.

Such marked and striking visitations of the deadly enemy of mankind clearly demonstrate that those terrible scourges are borne as invisible and destructive agencies, by the wind and by the intercourse of commerce, so that seas, oceans, and wide stretches of country seem to offer no barrier to their errands of destruction.

While scientists are busy with retort and alembic, in search of some antidote to kill the deadly poison, or to rout the disease from its stronghold, we are confronted with new forms, and fresh reinforcements to the mysterious ranks of our common enemy.

Diphtheria, though known since the days of Hippocrates, was until recently but little understood, its contagiousness unrecognized, and preventive measures unknown, so that it spread in merciless triumph from France, in 1765, to every part of the civilized world, marking its path with mourning and its development by a terrible mortality.

During the past few years influenza, in its wide-spread and aggravated form and modes of attack, is popularly regarded as a new disease, and heralded under the name of la grippe, which in its various phases and complications rivals any other single agency in its frightful mortality record.

It would seem, in considering the fresh acquisitions to the black banner brigade, that the high standard of sanitary science is holding in check the ordinary modes of attack of many diseases.

Our State Board of Health, in point of scientific acquirement, energy, zeal, and thoroughness of detail in its labors, stands second to none of its kind in this or any other country. Its regulations, requirements, and constant vigilance to maintain a high standard of sanitation, and to preserve the public health, have won plaudits and praise from every kindred board in the Republic and from those beyond the seas.

But true science and conscientious discharge of duties, and general harmony throughout the profession in this State are impaired by the action of our legislature, in leaving open the floodgates of recruits and receiving from all sections of this and other countries the vampires and guerillas of vulgar and ignorant quackery, who open gilded and tinsel offices in the midst of respectability, and commence a confidence game in the vicinage of educated and scientific physicians. And not far behind that class of presumptuous and impudent mountebanks lurk the insane phantoms of attenuated dilutions, masquerading in the form and garb of a learned profession, which by some mysterious and inscrutable jugglery of legislative legerdemain, succeeded in having its *ten-thousandth* dilution transplanted into a statutory enactment by which it became the *one-millionth part of a university*.

Such are some of the barriers to the advancement of exalted and thorough scientific knowledge, and zealous work in legitimate progressive medicine. The driftwood obstructs clear and rapid navigation. Some time, of course, is lost in brushing aside obstacles and explaining away the errors of ignorance, inculcated by aliens to the profession, or, as the late celebrated Lowell put it, "The colossal delusion of the nineteenth century."

There is another class of medical confidence men who open imposing offices, and placard the streets with the *old, old trap-door device* of "come into my parlor, says the spider to the fly." The remainder means fleecing the credulous, and taking the last dollar of the unwary and the unsuspecting. Such places are called by their proprietors "Dispensaries," "Surgical and Medical Institutes," and other high-sounding names; the object and aim being to assume a borrowed plumage of respectability, and carry on a swindling and disreputable business.

The best directed efforts in sanitary science, with such formidable and persistent obstructions, fall short of our best wishes and efforts, and the most effective instrumentalities seem to have lost in some degree their force and efficiency. With this digression I return to my theme.

Viewing the foregoing, what is the scientific aspect of the tremendous energies concentrated in those morbid phenomena thus arrayed against the peace, happiness, and life of pleading and suffering mortality? What can we do to avert, in a measure, the constant and envenomed encroachments of our mortal foe, armed with an arsenal of frightful weapons, threatening our health and life by constant menace, and holding in defiance all that science and skill can formulate or suggest? Surely the survey and contemplation of the annual mortality list justifies the poet's idea that "man was made to mourn." But the enemies of life are not confined to organisms of the animal kingdom.

Descending the scale of complexity of organization, but ascending the scale of longevity, I invite your attention to a hurried survey of the causes which lead to the death of the representative giants of the forests and the smaller things that flourish in their shade.

The great spruce tree of San Marie del Thule, of Mexico, has attained a greater age, so far as scientific investigation has been made, than any tree on the globe. Its age is estimated to be 5,124 years, and, although struck with death, it still struggles for a continuance of life, in an unequal contest, and must soon be numbered among the dead.

It has been the Mecca of scientists, scholars, and travelers for a century; it was visited by Humboldt, Professor Holden, the celebrated naturalist, by Taylor, and thousands of others.

Extend, for a few moments, to that great tree consciousness, memory, and the power of vision, and the faculties of an intelligent spectator, and for a few minutes think what has transpired in the world's history since its youth.

It must have witnessed numberless changes in the earth's surface; islands have come up from the bottom of the ocean, and earthquakes have sent down other islands to the lowest depths of the sea.

Endowed with intelligence, the honored giant of the forest has beheld every step in the world's history from its earliest dawn as the abode of man.

It must have heard the rapturous echoes that delighted the heavenly host when the stars sang together, and the laughing music of the Euphrates, as its limpid waters warbled over the pebbles in the Garden of Eden, and saw the flash and gleams of the historic sword as it swayed back and forth before the grand entrance to the sacred bower.

It must have beheld with wonder and amazement the architects, masons, and plumbers looking over the ground for the pyramid, jabbering in Coptic monosyllables about the quality and supply of granite blocks on which the stupendous pile was to be reared, and what the means of transportation were from the great quarries of Sinai.

Leaving the consultation about the pyramid for two thousand years, during the interval it was growing and expanding, and observing passing events, we come down to Solomon, whom it saw in all his glory and magnificence; and it was in full blossom when the Queen of Sheba visited the great King of Jerusalem.

It witnessed the construction of the temple, the rise and fall of Damascus, the destruction of Tyre, and the ruin of Joppa. It saw the founding of Troy, the birth of Antioch, and heard the delicious music of Homer's inspired verse, three thousand years ago.

That patriarch of the plain, which all men who have been fortunate enough to see, gaze upon with mingled feelings of awe, admiration, and wonder, was a towering tree when Athens was founded, 1,500 years before the birth of Christ; it saw the destruction of Troy, a thousand years before the Christian era; and it discerned the dazzling splendors of the star that guided the wise men of the east to the cradle of the Redeemer.

It must have heard the shouts of the Roman soldiers under Titus, and the thunder of his engines of war before the walls of Jerusalem, and beheld the fulfillment of the prophecy in the destruction of the Holy City.

That peerless and unrivaled monarch of the floral world, that king of kings and lord of lords of every forest and of all

climes, standing alone in his glory, serene, undisturbed, and noble in his grandeur, almost crowding the bounds and limits of immortality in the length of his life, his great heart swelling with the garnered wisdom of fifty centuries, his overhanging and shadowing top shading and cheering millions of sad and weary hearts, still looks down upon the busy world, an ancient and voiceless chief, thick and radiant with the clustering memories of five thousand years; a living monument of historical events that dwarf all human conception, as its life antedates all records, and extends from the earliest dawn of tribal life to the grand achievements and unrivalled splendors of the golden era, in the history of the world.

Yet that proud and time-honored chief, which has braved the storms and vicissitudes and changes for thousands of years, must now surrender its laurels and lie down like the infant that prattles love, and smiles upon the mother's knee. In the motionless silence of death it obeys the summons of a universal law; it dips its flag to the great destroyer.

Leaving the ancient and famous monument of unequalled vitality and miraculous longevity, with his laurel crowns thick around him, fading and growing dim in the gathering twilight of his age, we turn to a countless throng whose feeble and flickering lives, like the flash of a meteor, or the flame of a firefly, are mere transient evanescent sparks.

They shoot up from the earth under the expanding and vital rays of solar heat and light, put forth their buds and leaves and flowers in ceaseless joy, ripen with a smile in abundant and priceless fruitage, and with that boundless and prodigal charity which is nature's crowning glory, give all away and expire, looking and hoping for the annual resurrection which for six thousand years has not failed of its promise.

The formative processes in the primordial state of tree and plant are exactly the same; the cell development in each are precisely alike.

The ova of the lion and the mouse in their primitive condition cannot be distinguished. The microscope shows no difference whatever. All vegetable life originates by cells, and all forms of animal life commence their career by cell development,

differing only in their shape and arrangement. Referring again to plants, and their structure—the allotted period of an annual plant is short, but its activities are indeed wonderful. Its vital currents rush through its trunk with quickening and electric energies, urging speedy and prompt action, every bud and leaflet, thrilling in every fibre with its mysterious force and power.

The grain of wheat and the kernel of corn die, that they may fill the golden promise of renewed life; and herein we find a simple illustration of the Darwinian theory of the survival of the fittest, or natural selection. The plump grain of wheat, possessing more recuperative and latent power than the shrunken grain, crowds it out, crushes its life, and overshadows its grave by its umbrageous development.

The ear of corn shows many small kernels, which, in their growth, lacked the expansive power of their neighbors.

The spurred rye is the actual evidence of blight. It is a sort of vegetable gangrene, and sinks to a lower scale and grade in the race of life, loses its power of reproduction, and is radically changed in its construction.

The arrangement and the form of the cells in a century plant indicate a slow, sluggish, and patient growth. It requires no argument to prove that the developing force in this species of cactus, which stands at the head of a very numerous and respectable family, and excels all of its relatives for longevity, is, in fact, the very lowest type of dormant energy in plants. Hence the cells, nutrient vessels, arrangement of fibres, the character of its sustenance, and the manner of assimilation, are widely different from the annual, the vital currents and energies of which afford a striking contrast in plant life.

The circulation in the tree and plant life is not dissimilar to the circulating system in animals. The great venous sinuses convey the nutrition, rich in carbonaceous matter and aqueous materials, and hold in solution the various salts essential to the sustenance of plant or tree, while the leaves of either throw off the excess of carbon dioxide. Hence the carbonic acid eliminated, renders forests, or gardens of abundant vegetation, unhealthy resorts at night.

The wonders of constitutional arrangement of some plants have excited scientists to patient and laborious investigation. The one most striking, to my mind, is the mimosa of the Linnaean system, which flourishes on the banks of the Ganges, and is known as the sensitive plant. It has been asserted and maintained, that the mimosa has a real nervous system, so remarkably sensitive that it is capable of nervous excitement, and evinces a degree of sensation upon the slightest contact that still challenges the most rigid scrutiny into its ultimate constitution.

The monads, which occupy a middle ground or neutral territory between the animal and vegetable kingdoms, reproduce themselves by segmentation, dividing and subdividing, with astonishing liberality and accuracy, for every part kicked off or thrown off enters upon an independent career, with the same feeble and lingering life.

It presents a most remarkable and curious type of animated nature. The zoöphite is probably the very lowest form of animal organization—simplest of all known in science. Its form and color are peculiarly coral; it performs the function of digestion and respiration in the same organ; its position is that of a plant, and has that appearance; but all animal traits and characteristics are completely lost in the dim and mysterious encroachments of the vegetable kingdom, in the formation of coral reefs, which are the monumental tombs silently built under the waves of the sea, by living and busy organisms, to commemorate the universal law of death, manifested in the lowest as well as the highest forms of life.

Nothing can escape or evade it; there is no rescue and no appeal; the transformation is the fiat of the Almighty.

All of those beautiful plants, as well as the mighty spruce tree, are under the ban of the far-reaching and universal decree. Every plant is a martyr to parasitical ravages; every tree is surrounded by vigilant and active foes.

Having hastily reviewed the most prominent and conspicuous causes of the devastating and fatal epidemics generated by the putrefactive processes going on in the animal and vegetable kingdoms, and the awful train of evils that throng their pathway, let us now take a brief survey of the tribal hosts, and the

countless millions of industrious and meddlesome insects, which swarm in clouds, like the locust of Egypt, levying black-mail upon the district of their invasion, and destroying in their energetic march through states, empires, and principalities, every living leaf and bud of plant and shrub.

The "army worm" in legions, beyond all belief or computation, sweeps over a field of green and blooming cotton like the angel of death. Not a leaf, a bud, or a blossom can be found. It literally devours every leaf and strips the stalk, as completely and as thoroughly as if the work had been done by human hands, or by a consuming flame of fire.

To witness such a visitation one would think that the surface of the earth was given the power of locomotion—was actually changing its base, *en masse*, to a more congenial climate, so densely and so perfectly do the malicious parasites cover the ground.

They come up, like Jonah's gourd, in a single night, in multitudes and numbers beyond all human conception, and they move apparently under the orders of a veteran leader, in solid columns and at double quick, to the field of active hostility; and when the devastation is complete they vanish like an apparition, and no one can tell their abiding place.

You can witness a field absolutely alive with them to-day, swaying under a gentle breeze like a field of wheat, and to-morrow at dawn not one will appear at roll-call.

The Colorado beetle, known as the potato-bug, is a comparatively new importation from the universal arsenal of invading enemies; and, although a recent acquisition, it has proved a scourge of the most destructive character. The extent of its ravages are not generally understood, but the losses sustained, and the damage incurred by farmers, run up to millions upon millions of dollars; and this terrible guerrilla of the insect family has already crossed the Atlantic, and has spread consternation and dismay from Land's End to the Danube in its frightful invasion, and the ruin of the poor man's sustaining hope.

The phylloxera, a small and wiry worm, recently appeared in France, attacked the richest vineyards in such vast numbers, and with such destructive results to the grapevines, that the

whole business was really suspended. The loss entailed in France aroused Germany and Italy, and Professor Pasteur visited Italy at the request of the government, and by patient and long-continued and ceaseless observation, he discovered the habits and character of the pest, and then the great scientist first achieved his fame; for his plan and treatment were adopted and fully vindicated the accuracy of his observations by the extermination of the marauder.

He clearly described the habits and manner of generation of the worms, and suggested the remedy for their destruction; and the Academy of France, in recognition of his distinguished services in the same line of scientific investigation, voted him the highest honors within its gift, while the government awarded him a large sum of money for his unrivaled and remarkable services to his country and mankind.

Thus one may follow up this line of enquiry throughout the entire field that is open and inviting, but the labor is immense, the time is precious, and science is rigid and exacting in such details as are demanded in looking up the history, habits and general outline and characteristics of the thousands upon thousands of insect tribes, whose busy life is employed in plotting against the life, peace, happiness, and well-being of the struggling and powerless trees, plants, and shrubs, designed for man's physical and intellectual enjoyment and comfort.

From the ephemeral plant and flowering shrub and clustering vine, they attack with admirable and daring energy all classes and kinds of fruit trees. The peach, the plum and cherry trees, in their peaceful rest and useful sphere, feel the gnawing of the vile worm at their hearts and have felt the venom of its sting in bud and fruit and vital part.

The lofty and imperial oak is assured of its strength and position among the great trees of the forest, but like the assassin that robs a republic of its president, the ceaseless borer may rob the forest of its sovereign. In our beloved State the beautiful forests of pine, of priceless value, which have been the source of millions upon millions of wealth, have not escaped the ravages of the tireless borer. Put your ear to the trunk of a lofty pine and you distinctly hear the ceaseless sound of its invaders steadily

advancing to the heart of the tree. From the living oak and pine, contending with storms and tempest and tireless foes, to the ship's hull the eager vigilance and unremitting energies of the boring hosts pursue their work of ruin. So universal has been their united onset that copper plating was resorted to, to save many a noble vessel from wreck and destruction. It seems almost incredible, but it is nevertheless true, that in three years the boring hordes in countless multitudes will completely honeycomb a ship's bottom and send the vessel to the bottom of the ocean to find a tombstone beside a coral reef, if the danger were not discovered and averted.

The orange tree, the solemn and stately palm, the coffee shrub and the tea plant of the tropics, the oak and the pine of the temperate zone, the lichen of the polar circle and the algæ of the sea stand in constant dread of swarming enemies.

I know of nothing in the wide domain of life that is exempt from visible or invisible foes which are perpetually and fiercely attacking at all vulnerable points.

Human life is the target and repository of countless millions of disease-producing germs, unseen, invisible, and only brought to our knowledge by microscopic vision. They elude ordinary research and observation, but the fact that they generate diseases is as well established as is the law of gravitation.

We have considered briefly the ordinary agencies arrayed against mankind, and glanced at the universality of the fact that all vegetable life, in whatever form it exists, is pursued by a horde of enemies seeking its destruction.

Having alluded to the germ in its multitudinous varieties and forms, as ever present and always armed and equipped as the unsparing and merciless antagonist of mankind, now let us review some of the natural causes which have, from the earliest history of the world, contributed largely to the destruction of human life.

These natural events which have semi-occasionally saluted the inhabitants of earth were called by Clarence King, "catastrophic outbursts of indignant nature." We will only recall a few of them.

Among the natural phenomena to which I have alluded as

having performed prodigies of destruction in the course of human history, that form manifested as earthquakes stands pre-eminent. They have more frequently in the past than in the present really convulsed whole continents, and have extended their mighty energies in tremendous impulses throughout the entire hemisphere.

In A. D. 835, the city of Kaifong was utterly destroyed, with a loss of 200,000 lives. The earth opened as a vast and yawning gulf, into which the entire city was swallowed. Not a remnant, or apparently a fragment, escaped the awful chasm.

Antioch was destroyed in the 5th century and 80,000 of its inhabitants were lost. Lisbon, in Portugal, was nearly destroyed in 1755 by a terrific earthquake, and 75,000 people were suddenly precipitated into a dark and fathomless gulf, from which dense volumes of smoke and stifling vapors arose. The shock was felt all over Spain, France, Germany and Africa. Only a few moments are necessary, with such forces, to destroy a city or to ruin an empire.

Earthquakes have done more to change the contour of the globe than any other single agency.

In 1822, 100,000 square miles of territory in Chili were raised permanently six feet above the former level. By another earthquake that occurred in 1819, the Ullah Bund, in the Indies, a tract of land 50 miles long and 20 miles wide, was elevated ten feet, changing the whole features of the country.

In 1743, the city of Guatemala, Mexico, containing about 25,000 people, was instantly precipitated into a wide and bottomless gulf, removing from human vision every vestige of the city. The spot where the city stood is now occupied by a dark, dead, loathsome lake, in which not an insect nor any living thing can be found.

When the earth commenced its revolutions around the sun, it was not the abode of life. It has continued the gradual process of cooling and contracting in size ever since it was launched upon its independent career, and the stupendous and awful convulsions evidently derive their expansive powers and energies from the interior and have marked the earth's crust and features in a wonderful degree by changing the beds of rivers, the shores

of lakes, and the ocean's coast; in the upheaval of mountains, the depression of plains, forming lakes and estuaries and raising the great mountain ranges by an outburst of giant forces that excels in power all human comprehension.

The foot-prints of volcanic action extend throughout the entire Rocky Mountain range, through Mexico and the Andes to Patagonia.

In 1759, in Malpais, Mexico, from June till August, there were constant deep, rumbling, and portentous sounds, traversing a wide extent of country, attended with trembling shocks and vibratory motions of more or less severity, which continued till late in August, when in the middle of the night immense flames of fire burst forth from the earth, reaching far up in the air and lighting up a whole province, from which the inhabitants, believing the whole world to be on fire, fled terror-stricken in wild and mad disorder. Huge rocks were thrown into the air 2,000 feet and hurled to great distances, attended by loud and prolonged explosions. Six volcanic cones were formed on that level plain, one of which is 1,600 feet high.

In 1819 a tremendous eruption took place from several of those cones, covering the country with ashes several feet deep, and 150 miles from the cones ashes fell six inches deep.

In A. D. 79 the city of Pompeii, Italy, was literally buried beneath a sea of ashes to the depth of 50 to 150 feet. Theatres, temples, palaces, shops and council chambers, with the inhabitants of the entire city, were entombed for 1,700 years in the profound silence of death. The ruins were accidentally discovered by some peasants digging near the river Sarno, which gave the antiquarian a rich and wonderful field for scientific research.

When the superincumbent ashes were removed, the houses cleaned, offices swept out, and exchanges freed from the suffocating accumulations, a most astonishing spectacle was presented. The dead were found in exactly the same positions they were in when the awful avalanche and flood of ashes and smoke shut out the light of the sun.

Men were found in their counting rooms in the act of counting money and paying it out, scribes were found with pen in hand, with parchment before them, drawing contracts; clerks

engaged in making up accounts, artisans in their shops, artists in their studios. Women were found with all the articles in a well appointed *boudoir* engaged in adorning themselves, while the servants were found in various apartments in the act of attending to household duties. Others were found in the streets, evidently trying to escape by flight. Poor little loving children were found in beds, side by side, sleeping the sleep that knows no waking. The scene viewed 1,700 years after the fatal eruption has moved the stoutest hearts.

In the full meridian glow and vigor of life, in the quiet, happy, and charming domestic circle, with loving hearts, with bright promises of prosperous days, that entire city with its teeming thousands, basking in the golden radiance of sunny Italy, was suddenly called to the silent and solemn banquet of death.

The pulsating throb of the fiery heart of Vesuvius, shaking and tremulous with pent-up flame, sent forth, belching from its horrid mouth, a very deluge of death that rolled in mountain waves and ashen clouds over the doomed and ill-fated city.

The heavens were curtained in black. The very elements must have been hushed in awe, and death itself must have hesitated in view of the awful sacrifice, while the terrible outburst of destructive wrath buried the city from the sight of man.

We still have a number of active volcanoes serving as safety valves throughout the earth, with occasional feeble shocks and suspicious vibrations—like the one which occurred in California last month—as great apostles of nature's restrained and bridled forces to remind us that beneath our feet astounding powers and forces are held in reserve, ample in potential energy to bury a hundred cities in a moment of time.

The earth has not ceased to contract, [nor has the cooling process ended. When these changing conditions have reached a climax, and are no longer expressions of the great forces that have been in active operation for millions of years, this grand and stately globe will cease to be the abode of man. It will be a cold, cheerless, dreary, exhausted and worn-out mass of matter, unable to support a living thing. It will be a vast cemetery, a world of cenotaphs, of crumbling tombstones, of wrecked monuments and forgotten mausoleums.

As I stated at the commencement of this paper, death is a universal law; and as the law of gravitation pervades every form of matter, the realms of the grim messenger are without limit. There is no exception and no evasion and no Elysium in the boundless universe free from its visitation.

Death is the primal law of all created matter, and while longevity has a wide range, from millions of years down to the insect of a day, worlds cannot evade the far-reaching and eternal decree. Everything that commences in time must end in time.

The time is coming when this beautiful world, with all of its lovely cities, its kingdoms and empires and all that exists upon this sphere, shall be hushed in the perpetual silence of death. The cord of life will have vibrated for the last time, and thrilled the earth with its flickering and waning impulses. The gigantic energies of the central mass, in billows of fire, which have aided in warming the globe for countless centuries and vitalized its crust with heat, will have expended their force, lost their expansive power, and felt the steady encroachments of the dreaded monarch of this vast cemetery.

This is no pessimistic theory, or dream of moody minds; nor is it the fanciful metaphor of inflated rhetoric. It is the unalterable and inflexible decree from the source and throne of power, that no form of organic life, or inorganic matter, shall endure forever. Everything must submit to final transformation.

Having briefly and hurriedly surveyed a subject which has afforded me much thought, I must, in conclusion, devote a few minutes to our chosen field of labor.

In leaving this subject I must add that I should like to have pursued it to a logical conclusion. If time permitted, and my courage would sustain me to grapple with so great a theme, I fain would carry you in thought to the solar system, and to a more minute investigation of the laws of gravitation and the laws of motion, as applied to planetary worlds; but I forbear, and again return to the profession which we all so love, venerate, and adore; for I most devoutly and sincerely think that no vocation, calling, or pursuit contributes so much to alleviate the distress and suffering of our race, as the time-honored and regular profession of which we are members.

It stands in the front rank, and overshadows all feeble imitators, and has numbered among its members the most distinguished scholars, the most renowned scientists and pioneers in philanthropy that the world has ever known in its history.

Its high standing in all civilized countries is a sure mark of its inherent vitality. It was related of Von Graffe, when summoned to the palace of one of the crowned heads of Europe, that he declined to spare the time to go and required the royal patient to visit him. When Sir Morrell Mackenzie was summoned to Germany to attend the Emperor, it demonstrated the fact that kings and royal retinue were compelled to bow to science. The doctor was the king and Frederick the subject. When Sir Astley Cooper opened with his scalpel the dropsical limb of George III, it was the king who was honored, and not the surgeon. No patient, peasant or president, millionaire or medicant, confers any honor upon the conscientious and educated physician or surgeon who follows his profession as a gentleman, and his high calling with exalted and philanthropic impulses. His fame and reputation are acquired by undisguised merit, and by an intelligent and thoroughly scientific discharge of the duties devolving upon him. He neither seeks, nor would he accept, the meretricious and delusive aids resorted to by folly, but by self-sacrifice, zealous devotion, and untiring industry in his profession he wins the confidence, respect and admiration of his fellow-men.

It is especially true that in our profession, knowledge is power. He who feels the great responsibility of his calling views human life with a supreme and tender sympathy, and has a constant solicitude for those whose lives and health are confided to his care. The constant tendency, in our practice, is to elevate and refine the best attributes of human nature, which are touched by the sorrows and afflictions that come to every home.

And the medical profession has always been the irrepressible and persistent champion of sanitary science, and as a consequence, the promoter and preserver of the public health.

There is more self-sacrifice and ceaseless toil in the line of medical practice, more devotion to the public weal, and less of idle hours and social enjoyments than in any other profession.

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But we have our compensation in the thought and conviction of duties earnestly and conscientiously performed; that we have not turned a deaf ear to the appealing cry of the destitute and penniless; for if ever a human being hears the soothing and gentle melody of a whispering angel, or feels the warm breath-like incense rising from a grateful heart, it is when he is relieving a fellow creature of suffering and sorrow; when he has removed a bitter and keen agony, filled the tear-laden breast with sunshine and gratitude, given the afflicted one visions of coming joys, and thrilled his mind with emotions of happiness.

At that moment his best and highest aspirations and his noblest thoughts are in friendly communion with all that is lofty, beautiful, and pure in the human soul.

