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THE MT. WILSON RAILROAD.

By Hon. B. S. Eaton.

MOUNTAIN railroads are one of the many notable achievements of the last quarter of a century, — the first one having been completed in July, 1869. Modern science does not presuppose any physical obstacle in engineering that skill and pluck cannot overcome. Streams so broad and deep that they seem insuperable barriers to land travel, are spanned by bridges, resting safely on a succession of massive piers of masonry; and river banks which have been so dissevered by physical forces as not to admit of this method of connection, are reunited by supporting ropes of steel, so that man may safely cross in the rushing car hundreds of feet above foaming torrent or fearful chasm. Mountains are pierced from side to side so that, through miles of solid rock, the stream of travel and trade may flow on as securely through the bowels of the earth as over the smoothest of its plains. But it has remained for the last quarter-century to devise methods by which the summits of high mountains may be reached with ease, speed and safety.

The first mountain railroad ever built was that by Sylvester Marsh on Mt. Washington, New Hampshire, which was begun in 1866 and completed in 1869, two months after the opening of the Union Pacific road. Until 1876 the little village of Marshfield, on the mountain side, less than three miles below the summit, remained its starting point. From this place upward the railway has an average grade of 1,300 feet to the mile, while the maximum grade is 1,980 feet or 13½ inches to the yard. As Marshfield lies at an elevation of 2,563 feet, while the mountain is 6,273 feet high, there is left 3,710 feet of altitude to be overcome in less than three miles! Yet, so far as we can learn, no serious accident has ever occurred on this railroad, although it is estimated that 30,000 persons are carried over it annually.

What Sylvester Marsh has done for the White Mountains, a public-spirited citizen and scientist of California proposes to accomplish for that State. Several years ago Professor T. S. C. Lowe, while traveling through Southern California became interested in the natural beauties of the section and decided to make it his permanent home. To his friends he said he was going to rest, but the innate energy of the man has made him one of the most active figures among the upbuilders of this portion of the State. He settled in Pasadena, building there a home which is one of the finest and largest private residences in the State, enriched with the accumulations of travel over the world. From the lofty tower of his house Professor Lowe has one of the finest views of the Sierra Madres in the San Gabriel Valley, and it was perhaps the contemplation of this that suggested the building of a mountain road that would take the tourist from the valley to the summit of Wilson's Peak in a short space of time, while affording an opportunity to enjoy the magnificent scenery. Professor Lowe has always been identified with some project of more than ordinary magnitude. He is the father of scientific aeronautics in this country, and originated the plan of using balloons in war. From early life he has been a close student, devoting his attention especially to chemistry and kindred pursuits; making a specialty of the experiments in which the various gases and their relations, one to the other, played a prominent part. In 1857 he noticed that

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little attention had been given to the scientific study of aeronautics in this country, and with his accustomed energy he took it up and began an elaborate series of experiments. His first voyage celebrated the laying of the Atlantic cable, and was made from Ottawa, and in 1859 he constructed the largest aerostat ever built with a view of crossing the ocean, for the purposes of gaining knowledge of such meteorological phenomena as might not exist over the land. In 1860, at the invitation of the Franklin Institute of Philadelphia, he made a second attempt, which resulted in a memorial, signed by many distinguished citizens of Philadelphia, addressed to Professor Henry of the Smithsonian. A result of this was that Professor Lowe became the inventor of a meteorological system of which the present weather bureau is an outcome. He outlined a plan by which observations could be taken from high altitudes in various parts of the country and telegraphed to a bureau in Washington. His views were given freely to General Meyers, and as a result we have the present system. At the suggestion of Professor Henry, Professor Lowe made an experimental trip over the country before starting across the ocean. He left Cincinnati, Ohio, at 4 in the morning, April 20, 1861, and landed on the coast of South Carolina at 12 the same day, making the longest and quickest voyage on record. This was two weeks after the firing on Sumpter, and the scientist was arrested and thrown into prison by the Confederate authorities, but succeeded five days later in reaching Cincinnati again. The President, through Secretary Chase, then requested his presence at Washington, where he organized the war balloon observation corps, and for three years was chief aeronaut, rendering valuable service to the Government. During this time he made three thousand ascensions, and was the first to establish telegraphic communication from a balloon. His system and the many inventions connected with it attracted world-wide attention, and was adopted by the British, French and Brazilian armies, the Emperor of Brazil tendering him the rank of brigadier general, with large extra pay, if he would undertake the charge of the corps in the imperial army. Professor Lowe's contributions to science have been many and valuable. Among them may be mentioned the ice-making invention now in general use over the world, and the famous water-gas process for illuminating and heating, which is used in over five hundred cities in this country and Europe.

Professor T. S. C. Lowe.

His inventions have all been useful, and those intended for profit have in every instance proved financial successes.

Of his business experience and ability we have only to refer to some of the institutions of which he is the present head. He is President of the Citizens' Bank of Los Angeles, Cal.; the Los Angeles Safe Deposit and Trust Co.; the Pasadena Gas and Electric Co.; the Colorado Springs Gas and Elec-

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Snow on the Summit of Mt. Wilson near the Upper Depot.

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tric Co. He is Director, Consulting Engineer and a large owner in the Los Angeles Lighting Co.; Director in the Citizens Ice Co. of Los Angeles and in the Pasadena Fruit Packing Co. Professor Lowe is also owner of the Pasadena Grand Opera House Block, including the finest Opera House on the Pacific Coast; President of the Pacific-Lowe Gas and Electric Co.; owner of the New Lowe Gas and Electric system for the United States, Canadas and Mexico; and, lastly, President of the Pasadena and Mt. Wilson Railway Company.

Such is a brief glance of the man who has undertaken to build the finest mountain railroad in the world, and give to California an institution that will attract thousands to its shores. Professor Lowe's associates in this great work are all men of mark and notable business intuition. The vice president of the road is the Hon. P. M. Green, president of the First National Bank of Pasadena, who has been a prominent figure in the development of this section of Southern California. The treasurer is T. W. Brotherton, Vice-President of the Citizens' Bank of Los Angeles, while as an advisory board are the following well-known men, whose names are all associated with great successes in mercantile or commercial life. Gov. H. H. Markham, H. W. Magee, president of the San Gabriel Valley Bank; J. W. Hugus, president of the First National Bank of Rawlins, Wyoming; Dr. R. H. McDonald, president of the Pacific Bank of San Francisco; Andrew McNally, of Rand, McNally, the Chicago publishers; Hon. P. M. Green, president of the First National Bank of Pasadena; J. W. Scoville, president of the Prairie State National Bank of Chicago; Hon. T. P. Lukens, Pasadena National Bank, and A. C. Armstrong, of Pasadena.

Before glancing at the proposed work in the Southern Sierras it may be interesting to note some of the mountain railroads of the world that are already financial successes.

In the Alps we may mention the one that winds up to the top of Mt. Rigi, and another which accomplishes the still steeper ascent of Mt. Pilatus. Then there are two others near the Rhine, one climbing Mt. Drachenfals and the other the Neiderwald, while in Italy we are carried in a railway car to the crater of Mt. Vesuvius. Returning to our own country, in addition to the pioneer road up Mt. Washington, there have been built two among the Alleghanies, near Reading, Penn., one that scales Lookout Mountain, and, last and highest of all, the railway lately finished to the summit of Pike's Peak.

Mt. Wilson is one the prominent peaks of that section of the Coast range known as the Sierra Madre, and which forms the northern boundary of Los Angeles valley. Along this mountain chain there are several peaks as high as Mt. Wilson, and one or two that are higher, all connected by steep and narrow rocky ridges, most of which are very difficult to traverse. To the west stands Table Mountain, of equal height, and beside it "the Commodore," or San Gabriel, about six hundred feet higher, while farther on lies Mt. Disappointment, all plainly visible from the valley, but almost inaccessible on account of their ruggedness and entire lack of water. The special charm to the explorer of the wilds of Mt. Wilson is that near its summit there is plenty of the pure, cool liquid, while not for miles on either hand can any water be found on the higher portions of the range. Yet it is but recently that public attention has been specially directed to this wonderfully attractive locality. To learn how this grand recess of nature could so long remain hidden, we must refer briefly to some historical incidents connecting it with the recent incoming of American citizens to this part of the State.

About twenty-five years ago B. D. Wilson, a pioneer in Southern California, conceived the idea of procuring fence material from the mountain for use on his large estate. The scheme of a wagon road up its steep, rough sides was found to be futile, and even the opening of a trail that could be used

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by the sure-footed little *burro*, when loaded, was no small undertaking. After a while Mr. Wilson found that the timber was not durable enough to pay the cost of getting it down, so the trail was abandoned. In the lapse of years it was washed out by rains, grew up to brush, and became almost obliterated. But the settlement of Los Angeles valley went on, the land along the base of the mountains was becoming peopled, and soon the daring hunter and eager sight-seer were inquiring for the "old Wilson trail." Gradually the thorny brush was cut away, and the damages wrought by winter rains repaired, so that men with their pack-burros could reach the heights, camp in the evergreens, catch the trout, and enjoy "high life" in a primitive manner. Still the journey thither was too toilsome for many to make, as bedding and provisions must be packed up the narrow path, while deep chasms yawned below, as if waiting for man or beast, that should slip or stumble. Hence, while those who did go said "it paid" to have been there once, once was voted enough.

A new and different kind of interest in Wilson Peak is now to be chronicled, and one that will prove—has already proved—the germ of an enterprise of world-wide fame. In the fall of 1888, Harvard University, having on the Pacific Coast a large photographing telescope — 14-inch glass—consented, on certain conditions, to place this instrument on Mt. Wilson for a period of four months, and thus determine what special advantages the location might have as a site for an observatory. This, should it be erected, would be furnished with the largest photographing telescope in the world—one with a 24-inch lens, now in process of manufacture. The results of the four months' sojourn of the astronomical outfit were so remarkable that the time was prolonged to a year, and so well satisfied were the Faculty of Harvard that right here was the gem of all known localities for this branch of their scientific investigations, that prompt action was begun with a view to acquiring a clear title to as much land on the summit as would subserve all their purposes. But the telescope that had, for a year, done so much for astronomy on Mt. Wilson, had had a "great time" in making the trip. It had literally gone *per aspera ad astra.* Its entire fixtures, with the packing cases, weighed no less than 3,800 pounds, so that much had to be done to the trail before the safe conveyance of the precious tube could be effected; but the doing of it, with its attendant difficulty and expense, roused the people of Pasadena as nothing else could have done to the imperative need of a good road up Mt. Wilson. With two still larger telescopes to go up there, with all that the erection of an observatory and related buildings may imply, and the wants of an ever-increasing flood of visitors to provide for—it is certain that *we must have a railroad.*

Of course, after enough had been done to the old trail to make the conveyance of the present telescope possible, it was passable for travelers on foot and on horseback, and soon the silent heights were invaded by thousands of people, and the long-neglected peak became famous. Though the trip still has much of toil and a spice of danger, hundreds take it, and camps and restaurants near the summit are hard pressed to find bed and board for the eager throng. What wonder then that the call for a railroad should echo from cliff to cliff of our mountain, and that the valley should murmur the refrain?

A preliminary movement has been made in this direction, and the result is a new and better trail for saddle animals, and one that is generally more safe. Following the spur which forms the eastern boundary wall of Eaton canyon, we find an almost continuous line of ascent from the base to the crest, and this was chosen for the new trail because, by its windings and doublings, it could reach the top without trestle work, and with only one bridge. It has an easy grade, plenty of dirt for the roadbed, and is free from special danger from storm-water in time of

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rain. But not long will the people tolerate burro and mule riding and packing in an age like the present. The railway "with all the modern appliances" will soon carry us skyward, even from a bath in the ocean surf at ten o'clock to a seat on Mt. Wilson's crest ere the sun shall have made half his course from noon to the hour of setting. Can such a location longer fail of appreciation? No—the railroad is coming!

View of Ferns near Lower Depot, January First.

Let us anticipate the good time approaching by taking an imaginary trip on the rail. A half hour brings us from Los Angeles to the center of Pasadena, 843 feet above sea level, and only three miles on an air line from the initial point of the mountain road proper. But this three miles has an average slope of 230 feet to the mile. The Altadena road has already, in seven miles of detour, overcome over half of this ascent, and two-thirds of the direct distance. An ordinary traction railway can easily be made to surmount the rest, while giving us by its curves a chance to view the whole of Pasadena in differing aspects. To the north the rugged mountain wall shuts off distant views, but is impressive in its rough grandeur. It is mostly covered by a thick growth of brush, which relieves its otherwise barren appearance. But look southward as we journey toward the base. Yonder lies the "city of homes," spread out in one broad panorama of beauty. There are its parks, and orchards; there its gardens and grounds displaying the fruits and flowers of every clime; there stand its mansions, with lawn and terrace adorned with walks and statuary, and all that wealth and taste can contribute. Another curve of the railway, and we see streets embowered with the pepper and the palm, and lined with cottages covered with climbing roses—a veritable fairy-land. As we recede from these we can still mark the loca-

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tion of the large school buildings, and count the spires of its many temples of worship. We begin the ascent, catching here and there a glimpse among the foothills of little canyons with spots of fertile soil watered by trickling brooks that have tempted hither the quiet settler. Here, away from the noise of town, many a picturesque home has been made, supplied with fruit trees and adorned with flowers, where the owner may rest content, enjoying much of pleasure that is unshared by denizens of thickly settled communities. But sweep on and up, further into the rocky solitude, and the view below is shut out, while new and varying objects engross the attention. We are threading our way along the western bank of Eaton canyon. Adown the rocky bed, far below us, in winter there dashes a raging torrent of water which dwindles in summer to a small, silver brook. So steep is the bed of this canyon that while we enter it several hundred feet above its bed, we find that long ere we reach its summit we shall be gliding on our upward way along its rocky bottom. In whatever direction we gaze it is now mountains, all mountains—wild, irregular, indescribable. In one place a mural precipice rises from the canyon bed 500 to 600 feet perpendicular, then slopes gradually back an indefinite distance. This and other like cliffs could not be ascended from the base, and the slopes above are covered with a thorny growth so dense that no one can penetrate it until a path has been chopped out foot by foot. Occasionally, as we wind around some projecting rock, we catch a glimpse of the temporary observatory 3000 feet above us. When we entered the canyon we were only three and a half miles—air line—from that point, and yet, after passing over nearly twice that number of miles of track, we are only half way up. Such is the clearness of the atmosphere that it seems as if a bird could reach it by a mile of flight; yet there are cliffs so frightful and gorges so deep between us and our goal that even wild animals avoid them, as if in fear of being entrapped therein. But, thanks to engineering skill, we wind safely in and out among their recesses, and soon reach the point where the narrow and crooked chasm broadens, and we find ourselves on the "pine level." Instead of a walled-in and narrow valley, we are in a broad basin that appears entirely surrounded by mountains. Countless smaller canyons branch off in every direction, as if seeking a place of exit. Dark fir trees, with lofty pines and cedars, adorn their sides and hide in their recesses, beckoning us to explore their cool depths, where, perchance, over some cliff there tumbles a crystal cascade, the water below rippling and rollicking on until it falls into a mirror-like pool, the home of the mountain trout.

Another one thousand feet up and we are still in the pines; in fact the forest region reaches to the mountain top. We are now as high as the city of Denver, and as the Lick Observatory on Mt. Hamilton. Now we encounter a chaos of enormous granite boulders—the original field whence came the hard, heavy spheres that abound in the beds of all our mountain streams, miles away from any formation that could have produced them. Up here these granite rocks are as irregular and angular as if thrown out by a blast, or reft from their original stratum by some convulsion of nature, while down below in the torrent beds, their features are rounded, their angles worn away by attrition and the action of water, till often their surfaces are fairly polished. A little further on, and for the first time since leaving the valley, we emerge in full view of Mt. Kinneyloa. This is a spur from the main ridge, running out in a southern direction at nearly right angles, and has the general contour of a lofty headland or promontory jutting out into the plain. Viewed from below, Mt. Kinneyloa appears like an immense number and endless variety of rocks *piled up* in the most promiscuous manner. To the observer in the valley it seems higher than the main ridge, and is sometimes mistaken for Mt. Wilson itself, though

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The Wilson Trail, Showing the Trees.

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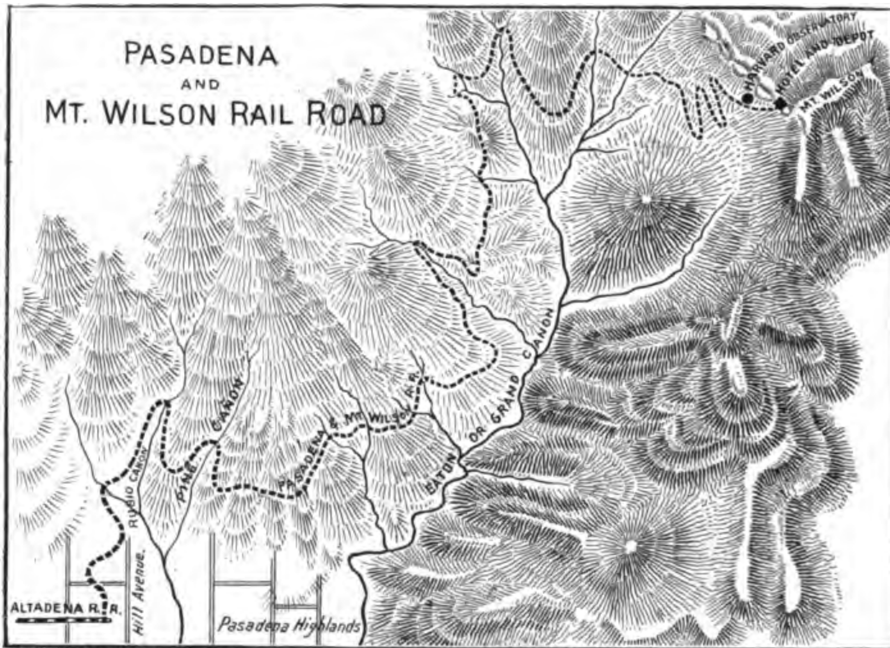
it is really three hundred feet lower. This is a spot much frequented of late, because it affords a fine point of observation, having a large scope of horizon on account of its singular position. Its highest point is distant about one mile from Wilson Peak, and is reached by a footpath branching off from the "old trail." This curious mountain spur forms the divide between the Eaton and the Santa Anita canyons, and is so precipitous along portions of its sharp backbone, that rocks thrown down on either side, will not stop until they reach the bed of the mountain creeks, perhaps 1,000 or 2,000 feet below. Such a favorite pastime has this been with visitors that hardly a rock of moveable size, that is big enough to make a racket in falling, can be found in these sections of the ridge pathway. About half way between this peak and Mt. Wilson a saddle or depression in the connecting ridge marks the head of the west fork of the Santa Anita canyon. When the Harvard telescope was taken up a camp was established here for the accommodation of the workmen, though it required the labor of two men half a day to clear off and level ground enough for a couple of tents. After the workmen left, a Pasadena caterer conceived the idea of establishing a permanent camp for the entertainment of visitors. And he made a success of it, notwithstanding it was near 5,000 feet above his base of supplies, which must all be conveyed thither on the backs of animals. Yet his guests were treated to all the market affords—fresh meats, fruits and vegetables, which the fierce appetites of mountain climbers could not fail to appreciate. This mountain restaurant business grew apace; more ground was cleared and more tents erected, until now the "camp" has the appearance of a miniature village. And, though the place has changed hands, it still continues to enlarge its borders, compelled thereto by the ever-increasing throng of sight-seers. This station or camp is a half mile below the summit, as the old trail goes, but it has a fine outlook to the south and west, and a few minutes' walk will



Map of the Mt. Wilson Road.

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take you to the points of rare interest. But the train moves, and winding gracefully round the head of Eaton canyon, gradually gains in its north-westward sweep a low point of the main ridge, where the track passing over, doubles back upon the northern slope. But before making the last principal curve let us take a comprehensive view of the great amphitheater, along the upper edge of which we have been skirting to reach the crossing point. Before gaining the little village of tents we had been going to the south-eastward, but since passing that location we been retraversing the same slope, only at a higher level, from which the view baffles description. You pass in review almost the entire route over which you have come, and wonder how, almost unconsciously, you have been conveyed to such an altitude. Directly below you lies the great basin into which the canyon we ascended has conducted us. Glancing back at its tortuous and oft-hidden course, we can see how spurs from the mountains on either side continually project themselves into its bed, as if enviously trying to prevent the formation of a highway by which the waters of this broad depression might have egress to the thirsty plains below. Scattered through the basin are baby mountains of cone-like form, clothed, like their more pretentious neighbors, with forests of pine and fir. Countless ravines seam the rim of this great upper valley, which all pay their winter tribute of water to the main stream that forces its way down the great canyon, while here and there we see the beetling precipice, on whose side no foothold could be found, yet the top is crowned with lofty trees. This description of scenery would be incomplete did we not pause to review the flora of the region through which our railway has passed. For miles before we reach the base of the mountains, there are, in springtime, great fields covered for weeks with the brilliant California poppy, so bright with color as almost to dazzle the eye and to be visible many miles away. As the mountains are entered we find a variety of wild flowers that grow nowhere else, and exhibit tints and fragrance not met with in garden or conservatory. They do not bloom early, but many may be found during the entire season.

We are at the crossing-over point of the mountain ridge, and must course along its northern slope, losing sight for a few minutes of the enchanting vision over which we have been lingering. The outlook now is all to the northward, and a wild wilderness of mountain peaks and ranges meets the eye. Soon the final station is reached, and we leave the car, while the mind, already weary with the contemplation of preliminary wonders, briefly folds its wings and permits the bodily frame to partake of the good cheer appropriate to the place and occasion.

Standing upon the crest of Mt. Wilson, and looking directly west, you find the view intercepted by "The Commodore," 600 feet higher than your present position. North of this peak, and across the valley of the Arroyo Seco, are two cone-like peaks—the Big and Little Strawberry mountains, the former standing 7000 feet above sea level, the peculiar shape of their summits suggesting the nomenclature. Turning half round your attention is attracted by a mountain that differs in appearance from all the others. It is known as Barley Flats, because, being covered with a variety of wild rye, or cheat wheat, its general appearance resembles that of a barley field. The surface is free from rocks and underbrush, and, though rolling, has no precipitous slopes, while the umbrageous pines scattered over it make it look not unlike an immense park. Its distance is five miles away, but you are separated from it by the valley of the north fork of the San Gabriel River, and the adventurer who thinks to walk over some pleasant morning before breakfast, will find that he has to descend a steep mountain side of about 2000 feet — vertical distance — and scramble up an equally rough path to the same altitude on the other side.

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It is a good day's journey to go over to Barley Flats. This north fork furnishes fine fishing, as it abounds in mountain trout. A half mile east of the observatory stands Echo Rock, and from this point can be obtained one of the grandest views the world affords. Stretching away easterly for eighty miles lies a vast sea of mountains, distinct in their outlines, and covered generally with vast primeval forests that have yet to hear the echo of the woodman's ax. The first prominent peak to attract your attention is Mt. San Antonio, or "Old Baldy," 10,000 feet high, and then comes the Cucamonga Peaks, of nearly equal altitude, while in the distance lies San Bernardino—the base line peak—"Old Grayback," 12,000 feet high, and Mt. San Jacinto, of a height somewhat less. These last two stand on opposite sides of San Gorgonio Pass like grim, hoary sentinels at the gateway into the paradise of the coast. But these great peaks are so distant that Mt. Wilson loses nothing of its height by comparison with them. Now we return to the contemplation of what the south and southwest can reveal—the scenes last and brightest of all in the round of the horizon. At our feet lies Pasadena, already passed in review. Beyond its confines the eye falls upon the great Raymond Hotel, where hundreds of tourists find one of the best of winter homes, and to whose hospitable halls many of them return year after year, so potent are its attractions. South Pasadena and Alhambra lie just beyond; Duarte, Glendora and Whittier can be seen; while Azusa, Covina, and, last and most ambitious in her outreach for distinction, the city of Ramona, are all within the scope of vision. Other young towns might be named, but Los Angeles, the queen of them all, appears in the southwest, while the seaside resorts are discernible beyond.

What is this glory of celestial blue that lies gleaming on the horizon? The ocean on which Balboa first looked from the Isthmian mountains, and which Magellan first traversed 370 years ago—it is the Pacific that rolls before us, and only about thirty miles distant on a straight line. Out in the blue deep, some twenty-six miles, can be seen the island of Santa Catalina. Its general appearance, as outlined against the sky, is that of a continuous low mountain, with a depression near the center, which almost severs it in twain. But, under atmospheric conditions favorable to *mirage*, it will assume many grotesque forms. I have seen the eastern end, which is really a gradual slope, apparently rise in the air like a perpendicular cliff 1000 feet high, and at times even to overhang the sea. Occasionally a portion of the ridge will assume the shape of a high table of land, upon which appear forms resembling castles and towns, with pillared colonnades, or rows of immense columns standing roofless, reminding one of pictures of the ruined temples of old, or of the unearthed remains of Pompeian splendor. San Clémente is another island made interesting by the archæological treasures found there. Farther north lies the island of Santa Barbara, opposite the city of the same name. The surf on some portions of the shore-line is plainly visible when the light is favorable, as also the shipping, sometimes as far as the harbor of Avalon, in Catalina. Let us round out our day of high enjoyment by watching a sunset on the Pacific. Word-painting of the scene is all too weak—let imagination wrestle with it alone. Now the landscape darkens and the shadow creeps ever higher up the mountain side, while below, from the cities of Los Angeles and Pasadena, the electric lights flash out until at last, down in the broad valley, there seems a constellation that endeavors to outrival that in the heavens above.

Again, we wake from a most refreshing sleep to witness a sunrise from the summit. We stand on what seems a celestial vantage ground; but how changed the scene from yesterday! A snow-white sea of fog covers the broad valley, leaving only a few hilltops, like islands, above the gently shifting un-

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Car Going up Eaton Canyon.

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dulations—while above, the sun pours his full radiance on the wonderful *fleeciness* of its dazzling surface. Imagine the effect—it cannot be told. When the eyes become weary from its contemplation, let us rest them by examining the ground about our feet. Its most striking characteristic is a remarkable unevenness. There is no *level* plateau up here, and scarcely a spot can be found large enough to spread a blanket without finding too much slope to allow one to rest comfortably upon it. Still it is not desertlike, for everywhere there is vegetation, varying from the lowly flower to the lofty forest tree. But the fog is scattering, and we can see its remnants floating as bright clouds far below. The beauty and grandeur of the scene are enhanced by the revelations of our second day on the summit, and one feels the inspiration that naturally possesses those who find themselves elevated above all their near surroundings.

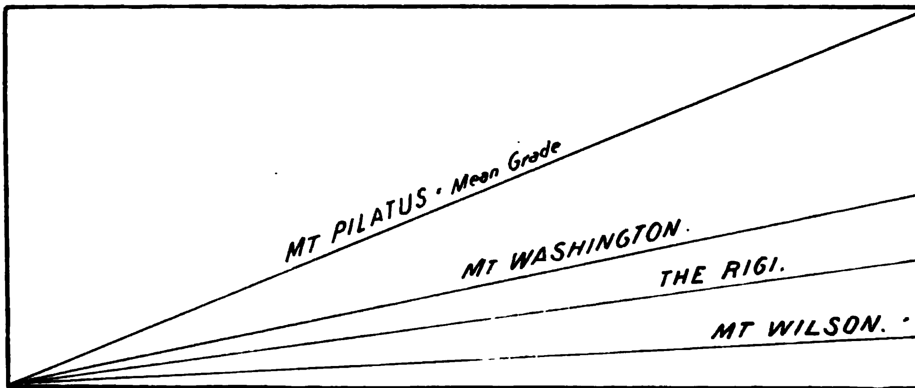

Diagram of Grades.

To visit the Pacific Coast and fail to ascend Mt. Wilson will, in the future, seem as absurd as to go to Egypt and not look at the pyramids, or journey to Rome and neglect to examine the Coliseum or view the Vatican and St. Peter's. Mt. Wilson is destined to become the Mecca of tourists in Southern California; it will be sought for summer residence by many who prefer the highland air to that of the sea shore, as soon as the railway shall make it entirely accessible. Nor will it be a favorite resort in summer only. When the eastern tourist becomes tired of our midwinter surroundings of dark-green orange groves, spangled o'er with golden globes—when he wearies of the springtime verdure of barley fields and alfalfa plot, he can, in two hours' time, betake himself to the cold region he longs for—he can find a mantle of snow covering the rocks of some of the remoter slopes, and gathering heavy on the cedar branches in some dark ravine, and enjoy snowballs, and, perhaps, a toboggan slide, or skim on the flying skates over the frozen surface of the artificial basin already planned for the delight of such as he. There is room for hotel and summer cottage; there will soon be extra buildings for scientific purposes, with numerous other attractions. And when one wearies of the wind and cold of the summit, he has but to step on the car and glide down to sup and sleep among the roses and orange groves of Pasadena.

The Mt. Wilson road possesses advantages that others do not. Most of the mountain railroads already built are in latitudes that render them unavailable except in the summer. That on Mt. Washington has a "season" averaging less than three months, while the road up Mt. Wilson will be serviceable the entire year. The local population around Mt. Washington is small, so that most of its patronage must come from distant cities, while

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within one hundred miles of Mt. Wilson live almost half as many people as appear in the census of the whole State of New Hampshire. The Mt. Washington road needs endless repairing on account of the extensive use of timber supports in its construction, while on the California road nearly the entire structure will rest on a foundation of solid rock. More people already visit Mt. Wilson annually, with only foot and saddle for conveyance, than are accustomed to ascend Mt. Washington, although a good carriage road exists to above the timber-line. Owing to our southerly position Mt. Wilson is clothed with forests to the summit, while for quite a distance below the crest of Mt. Washington bare and barren rocks alone greet the eye. During the brief summer season frequent clouds and rains often disappoint the tourist in the outlook he desires, while on Mt. Wilson, taking the whole year, rainy season included, probably not more than one day in fifteen would prevent "full, unclouded vision."

The nearness of the ocean, with its attractive beaches and hotels, gives an advantage to Mt. Wilson, with which the inland situation of Mt. Washington cannot successfully compare; while the great observatory will add a unique attraction to persons of scientific tastes who wish to take their vacations on this coast.

A comparison of the real usefulness of the roads already built with the proposed one is fraught with interest. It can readily be seen that the easier the grade on a mountain road, the more it can do in the way of transporting supplies of all kinds, especially of building materials. The railway on Mt. Washington has to overcome an altitude of about 3,700 feet in three and a half miles—average grade, one foot in about five. That on Mt. Rigi reaches an elevation of 4,368 feet above its starting point in five and one-fourth miles of track, being a grade of about one foot in seven. On Mt. Pilatus an altitude of 5,344 feet is reached with somewhat less than three miles of track, necessitating the almost unparalleled steepness of grade of one foot in a little less than two and a half. The road up Mt. Wilson will "take it leisurely," using over twelve miles of track in making the vertical ascent of about 4,700 feet, rendering this railway capable of doing a fair transportation business in all lines necessary, the grade averaging only one foot in over fourteen. Hence, a higher speed can be maintained with an equal amount of motive power. The accompanying diagram will show the relative gradient lines of these four mountain railroads.

It is interesting to know that each and every one of the roads has yielded a large per cent on its cost, in short, has been a paying investment. It is believed that Mt. Wilson will pay better than any of the roads mentioned, besides exerting a far-reaching influence on the immigration to Southern California, and on the character of that immigration. We are told that fares will be lower on the Mt. Wilson road than on the others, on account of its greater patronage in the fourfold length of season. The motive power used will probably be electricity, since engines of less weight in proportion to their tractive force can be employed. The road is to be built and equipped in the most substantial manner, and furnished with every known appliance for safety and comfort. And when citizens of Lower California conclude to make summer homes among the wholesome pines of the upper heights, they can be carried to and fro on commutation tickets as readily as between Pasadena and Los Angeles; while the longer time it requires will be more than made good by the enjoyable nature of the trip. The rate of speed, though not expected to equal that on ordinary railways, can easily be made to double or triple that of the steeper mountain roads.

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