Correspondence.

The Recent Earthquake at San Diego.

To the Editor of the Scientific American:

I noticed in the last number of your paper a letter from a correspondent from San Diego regarding the recent earthquake in Southern California, from which your readers might infer that earthquakes are frequent and dangerous here.

I have lived here more than twenty years, and the last earthquake was the most severe that has occurred during that time. I was lying in bed, awake, at the time it happened, and I thought at first that it was a sudden and violent gust of wind that was rattling the window frames; but I soon realized that it was an earthquake. The rattling was exactly like, in duration and violence, the effect produced by a heavy and close clap of thunder, but, of cours , without the noise that the thunder makes. I was in a well-constructed, three-story house. No walls were cracked, nor any articles knocked from shelves. A gentleman and his wife, who slept in the room next to mine, were not awakened by the shock. I did not get out of bed, and was asleep in a few minutes after it was over. During the "boom" times here a few years ago a great many poorly constructed buildings were erected. The clay from which bricks are made in Southern California is generally of very poor quality. Fuel for burning them is very high (wood $7 per cord, coal $1 per ton), and, in consequence, bricks are very poorly burned. Buildings constructed from such bricks cannot stand much shaking. In some such structures the walls were cracked slightly in a very few instances; but there was not a single case of a crack in any well-constructed building where good, hard bricks had been used.

J. THOMSON.

San Diego, April 10, 1892.

Another Mathematical Prodigy.

To the Editor of the Scientific American:

Having read in your last issue an account of what may properly be called a mathematical prodigy, I think it may not be uninteresting to your readers to hear of another, which, in some respects, surpasses anything of the kind ever related.

Reuben Field is a native of La Fayette County, Missouri, a very strong, heavy set man, about forty-five years old. He never went to school, even a day, for the sole reason that he was always regarded an idiot. He can neither read nor write, and his reasoning powers have never developed beyond those of a child of the most ordinary intellect. In the face of these facts, however, he has the keenest perception of the relation of numbers and quantities, and is able, as if by instinct, to solve the most intricate mathematical problems. He does not know figures on a blackboard, but he understands them perfectly in his mind. No one has ever been able to "catch him" in multiplication or in division. He has been given problems as "The circumference of the earth is, in round numbers, 25,000 miles. How many flax seed, allowing twelve to the inch, will it require to reach around it?" Within a minute he returns the answer: 19,008,000,000. If the distance to the sun or to any of the planets is taken, he answers with as great ease. If given the day of the month and the year on which an event occurred, he instantly gives the day of the week. But what is yet more remarkable is that he can tell the time at any hour, day or night, without ever missing it even a minute. If awakened out of a deep sleep in the darkness of night, and asked the time, he gives it at once. Once in my office I asked him the time. He replied at once: "Sixteen minutes after three." In order to test him, I drew him off upon some other question, not letting him know my object, and when seventeen minutes had passed, I looked at my watch, and asked him the time. He said: "Twenty-seven minutes to four."

N. T. ALLISON.

Columbus, Kansas, April 16, 1892.

Climate of San Diego.

To the Editor of the Scientific American:

Thousands of people searching for a climate beneficial to consumptives have had a great deal of misinformation spread before them concerning Southern California. Laudatory and derogatory statements have been mixed together by writers whose views have been unduly colored by prejudices resulting from bad effects of the climate in certain cases, or by too free an entertainment by shrewd hotel keepers who want to make a writer feel good and write compliments for publication. It is difficult for an Eastern man to get absolute facts about Southern California. Allow me to state a few facts within my experience as a consumptive in San Diego since September, 1891. The winter was of exceptional severity, and therefore a good sample of what this climate is at its worst. We had rains, fogs, high winds; once or twice hail stones rattled against the window panes for a few moments. An earthquake cracked walls of buildings one night and thoroughly scared the strong and the weak. On the other hand we had fully two-thirds more mild, brilliantly sunny days than I found on the Atlantic slope during all of last summer.

There has been an equability at this sea coast town which delighted me, because, as an extremely delicate man, my system has been susceptible to slight changes of temperature. Only one week throughout the winter did the temperature fluctuate so decidedly as to cause remark. It then went below 32° F. in the lowlands. At an altitude of 150 feet the green tomato vines were untouched by frost. In the aggregate there have been, as nearly as I can recall, several weeks of cloudy, windy weather, when outdoor life was not advisable for a man in my weakened condition. The remainder of the time I have been able to stay outdoors eight or nine hours daily, sitting down the greater part of the day. Ocean fogs came in at night frequently, in the form of clouds, remaining about 1,200 feet above the town. In the morning they rolled seaward about eight or nine o'clock, to return at sundown. There was no fog low down. These fogs increase the humidity and add to the discomfort of some consumptives. But even so, the relative humidity here averages only 70 the year round, while the cool nights and warm days offer the exact conditions under which humans best thrive, according to such authorities as J. Henry Bennet, Briggs, and others. The fogs exist only a few months during the year. The rainy season does not deserve that name. It has not rained one day continuously since September. Light rains have fallen at intervals, amounting in all to about ten inches. The average fall for the year is eleven inches. The relative humidity records of New York or Boston show a lower relative humidity at those points than at San Diego. The absolute humidity of this point, however, is seldom approached in the East. The dryness of the air here is frequently but a fraction of a grain of moisture to the cubic foot. A reputable physician says meats and fish are cured in the open air here without putrefactive decay.

The difference between sunshine and shade here is more marked than in the East. New comers who sit in the sun and move into a shady corner may, in case they were too thoroughly warmed, catch cold. Invalids walking along the sun-bathed streets may suddenly meet an ocean breeze and become chilled instantly. Consequently prudent invalids always carry a light overcoat, and exercise more caution against chilling than is usual where the differences between sun and shade are less marked. Southern California has been roundly abused by people who have come here, and thinking the climate was almost tropical, have been careless, caught cold and suffered. Two friends of mine were stupid enough to put on light weight underwear on coming here. They caught cold at once. Delicate people must be very cautious all through California.

Climate is merely a helper to a consumptive. Good food and diversion are helpers of almost equal importance. They are found here. As a rule, no climate will permanently help a consumptive in the last stage of the disease. Such cases will find only temporary, if any, relief in the West. Incipient and secondary stage cases may find arrestment of their trouble in California. Thousands of people hereabout claim an arrest of consumption in their systems through life in this vicinity. My experience, as one in the last stage of phthisis, though a case where unusual vigor of the system has been aided by unimpaired digestion, convinces me, in spite of humidity, fogs, winds, and other disadvantages, that thus far the comfortable living accommodations, good food, and diversion offered right here on the sea coast overbalance the advantages of climate offered in New Mexico, Arizona, and elsewhere, coupled as those advantages are to the monotony, poor food, and some disadvantages climatically, which invariably attend life at these inland lung Meccas. And most important of all is the fact that here I can be outdoors more days in the year than any other place I know of in the world. Outdoor life and good food have added ten pounds of flesh to my bones and increased the cellular resistive power of my diseased lung; then, too, I have not been continually on the move in search of the ideal climate, and thus exhausting my vitality.

M. Y. B.

San Diego, Cal., April, 1892.

Ten Commandments to Switchmen and Brakemen.

First.—Don't take hold of a link to couple cars with a wet glove or mitten in frosty weather. If you do, it will stick to the link and your fingers will suffer.

Second.—Don't take hold of the head of a pin in a drawbar with your fingers back of the pin, or between the pin and the deadwood. If you do, and the pin is crooked or the draft iron is driven back far enough, your fingers may get nipped.

Third.—Don't go between cars to couple them where the load (logs, lumber, poles or railroad iron) projects over the end of the car. If you do, you may get crushed.

Fourth.—Don't attempt making a coupling between cars moving with force where the lug has been broken on the drawhead, without taking into your calculations that the drawhead is liable to be driven under the car. If you do, you are liable to have your hand taken off or get yourself crushed.

Fifth.—Don't swing and throw your whole weight on a brake wheel on top of a car, without knowing that the nut is on top of the brake rod. If you do, you and the brake wheel may take a tumble together, and the consequences will be more serious for you than for the brake wheel.

Sixth.—Don't step with the heel of your boot on a frog or on switch rails that are close together before or between moving cars. If you do, the frog or rails are liable to hold your foot as in a vise, and the moving wheels have no mercy.

Seventh.—In coupling freight cars where one car is higher than the other, always have the link in the highest draft iron; you will then not have to hold the link up, and the link will in a measure guide itself.

Eighth.—In coupling cars on a curve always stand on the outside of the curve; then, if anything gives way, or the load shifts on a flat car, you stand a better chance of escaping a squeeze.

Ninth.—If you think cars that are to be coupled up are coming together with too much force for safety, keep out and let them strike. It is much better for you to be called a "tenderfoot" than to lose some of your limbs.

Tenth.—In coupling a coach with a Miller coupler to a car with a common drawbar, always have the link in the Miller coupler, as the link is not near so likely to slip past the drawbar as it is past the Miller coupler. Make the same rule in coupling an engine to a Miller coupler; take the link out of the tender and put it into the Miller before backing.

Asphalt in India Rubber Compounds.

From the beginning of the rubber business manufacturers have appreciated the use of asphalt and tar in a variety of rubber compounds. Especially has this been true in goods cured in what is known as the dry heat. Boots and shoes, clothing and insulated wire compounds to-day all have a certain percentage of what is known as tar, but which is usually purified asphalt. The common belief that the goods are injured by the addition of this substance is wholly erroneous; a certain amount of asphalt compounded with rubber assists in calendering and during vulcanization imparts a certain toughness to the rubber which is not to be gained in any other way. The proportion used to-day is but small. For example, what would be known as a rich compound is 18 pounds coarse Para, 11 pounds litharge, 40 pounds whiting, 3 pounds asphalt, ½ pound lampblack, 11½ ounces sulphur. Exactly what asphalt is very few people seem to know, and it is almost invariably in the popular mind confused with coal tar. Asphalt as a paving material has been known since the Babylonian empire, and to-day paving blocks are found that preserve their integrity and have hardly begun to oxidize in spite of the atmospheric changes to which they have been exposed. It is only within late years that asphalt has been well known in the United States. It looks very much like pitch, and when ignited burns with a bright flame, giving off a dense black smoke. Alcohol, ether, oil of turpentine, naphtha, and many other reagents easily dissolve it. Its specific gravity is 2·23.

Until very recently all the real asphalt used in this country was imported. There is in the island of Trinidad a lake nearly two miles in circumference which is the source of the most of it, and it is said that near the shore the asphalt is very hard, but out in the center it is soft and viscid. When imported to the United States it comes mixed with sand and gravel and a variety of foreign materials, from which it is separated by heating over a slow fire for a week or more. During this heating process the impurities of a lighter nature rise to the top and are skimmed off, while the heavier substances settle to the bottom of the receptacle. There are very large deposits of asphalt in France and Switzerland, and within the last three years quite extensive deposits have been discovered in Utah and California, and small ones in Kentucky. For paving streets it is prepared by grinding first to a powder and mixed with crude petroleum and fine sand. It is then moulded into blocks of suitable size, or sometimes it is poured between blocks of paving stones, when it becomes hard, and greatly resembles the natural rock.

Another use for asphalt is in the manufacture of black varnish, where it is dissolved in oil of turpentine and linseed oil and makes an exceedingly durable coating. For insulating electric wires this sort of coating has been found of great use, and it is said that one of the best rubbers for wires to-day manufactured is made of a fine compound containing 30 per cent of India rubber, the compound after semi-vulcanization being dipped in boiling asphalt, which toughens it exceedingly. As asphalt is not affected by acids or gases, and is an absolutely waterproof compound, and as heat and cold do not affect it, it is a valuable article to use in connection with India rubber, although if too large quantities of it are put in it shortens the gum and may during the process of vulcanization cause it to blister. A great deal of the gum roofing sold in the United States which is thought to be India rubber or gutta percha is made simply from a solution of asphalt spread upon prepared paper.—*The India Rubber World.*