JUDGING ABOUT SIZES, DISTANCES AND HIGHTS.

Every observing person must have noticed that our judgment in regard to the size, distance or hight of objects is often erroneous, in case we are not familiar with either of them. Usually it is an under-estimate—that means, we think the object smaller, nearer, or lower than it really is, and this fact explains a great many peculiarities which have been the subject of dispute. Such as why the moon looks larger when near the horizon than when high up in the sky. The reasons of this and many other illusions about size and distance are as follows:

Man is accustomed to move on the earth's surface, and in this way trained to judge about distances and sizes as long as they are seen in a horizontal or nearly horizontal direction. But as soon as they are seen far above or deep below, he is at a loss to judge, and more so if no intermediate object furnishes him a scale to judge by.

A man of ordinary hight, say 5½ feet, is, at a distance of 315 feet, seen under an angle of one degree; and when he is on the ground, in a horizontal direction from us, so that we can judge of his distance according to our experience, he will appear of ordinary size; but if he is seen under such surroundings as to make him appear farther off, he will appear taller, as experience has taught us that when a man is farther off than 400 feet and seen under an angle of one degree, he must be above the ordinary size. We judge, as it were, instinctively about this, without thinking about actual distances or angles of one or more degrees. Place this same man high up on a tower or other elevation, without changing his distance of 315 feet from us, and we will no more realize the distance he is at, but under-estimate it by the absence of intermediate objects; and having the impression that he is nearer than he really is, he appears to us quite small, as experience has impressed us that a man must be uncommonly small when he is so near and seen under so small an angle. We do not think, and much less calculate about it, but judge by the mere superficial impressions, because when we investigate and begin to reason about it the illusion disappears in most cases.

It is easy to give illustrations of this general principle. A flag, wind-vane or other ornament on a tower or other very high building, is always much larger than it appears from below. Very few people believe that the arrow serving for a wind-vane on the postoffice, New York, is 16 feet long; the men working at the suspension bridge over East river look surprisingly small to such persons as are unaccustomed to see very elevated objects. The Palisades along the Hudson river are always under-estimated in regard to their hight by those who see them from a distance and do not realize the great width of that river; they therefore judge them to be, say, about 100 to 150 feet high, but when their attention is called to the two and three-story houses at their base, and which they at first think to be dog kennels, they have a base of comparison, and at last recognize that the hight must be 400 or 500, and in some places 600 feet, a hight which is only fully recognized when ascending one of the pathways leading to the top. Some of the most striking illustrations of this illusion are found along the banks of the river Rhine, in Germany, where in some of the colossal quarries, the men at work look like mere pigmies, for the simple reason that the distance of the mountain is under-estimated, and consequently its hight, and also that of the men.

India-rubber Hose for High Steam Pressure.—At a late meeting of the Edinburgh Association of Science and Arts, held recently, a short communication was made by Mr. Wm. Firth on the use of india-rubber hose for steam and high-pressure purposes. He exhibited a piece of canvas and rubber hose capable of withstanding a pressure of 4,000 pounds to the square inch, and also several other pieces of canvas and rubber packing, which, he said, were most useful for engineers.

How the Supply of "French Wines" is Maintained.—We read in an English exchange a report by English wine merchants who have lately made a close study of the wine production in France. They say:—"To judge of the effect of the phylloxera it is necessary to do as we have done lately—to go through the wine-growing districts of France and there to see the fabulous prices asked for the most inferior wines; and also to see how France is obliged to buy from her neighbors anything she can get as wine to supply her own consumers. France is actually draining the Spanish market, and we regret to say, some considerable quantities are bought by the leading Bordeaux merchants, who doubtless will send them to this market as clarets, thus destroy their reputation and that of Bordeaux wine. A more mischievous policy could not be followed, and if our readers find it necessary to have a wine at 5*l.* a hogshead, we would recommend them to buy it direct from Spain at less money than the same wine from Bordeaux merchants at a higher price. No genuine claret can be bought in Bordeaux under 5*l.* net cash by the merchants there, and at that price the quality is very bad; it, therefore, stands to reason that if they supply a wine at or under that price, it must come from other districts, and not be genuine French wine."

New Method of Making Belts.—A firm in Paris has devised a new method for manufacturing belts or bands for machinery, which is applicable to rubber, leather, woven tissues or gutta-percha, and consists in making the belt with longitudinal ribs or grooves, the main object of which is to increase the capacity of the belt of the same cross-section, say twelve inches, by the extra strength put in the same place, and also to prevent so much stretching and variation. Another modification of the same invention is grooving one side of the belt the same as saw teeth, then putting these two pieces together, leaving a plain bearing surface for contact besides, thus making a double belt which is less liable to stretch or to warp. Especial machinery is built for the purpose, and the claim for it is that better contact is given. The pores are closed during this grooving process, the belts have a higher resisting power, do not twist on the pulleys, the pressure and friction of the grooving process smooths and polishes the surface so that better contact and adherence is had. The grooves may be made regular, irregular, spiral or crossed.

To Remove Freckles.—No very sure remedy can be given for the removal of these unsightly discolorations, but the following has been recommended, and we publish it for what it is worth: Take 1 drachm of citric acid, and 4 ounces each of glycerine and rose water; mix and wash the face each night before retiring. Another wash is made of 3 grains of borax and 5 drachms each of orange flower and rose water. Apply every night, and allow to dry on the face.

RAINFALL WEST OF THE SIERRA NEVADA AND CASCADE MOUNTAINS.

At first sight, we might suppose that as all the great belt of country lying west of the Sierra Nevada and Cascade mountains, is exposed to the full influence of the vapor-bearing west winds coming from the vast water surface of the Pacific ocean, it would receive an unfailing and bountiful supply of rain. The interposition of the comparatively low coast ranges, between the great valleys of California and of Oregon, and the vapor-bearing winds from the Pacific, could hardly be expected to produce any very great diminution in the supply of moisture reaching these valleys. Yet the fact is far otherwise. Indeed west of the coast ranges, no less than on the great California valley, the rainfall, although usually sufficient to assure a remunerative return to the farmer, is frequently very scanty, especially the southern portions. Considering the comparative proximity to the great water-surface, and the direction of the prevailing winds, it is astonishing how little rain falls on the Pacific coast between San Diego and Cape Mendocino. Not only is the amount of rainfall smaller than might be expected, but it is quite irregular, and thus involves the element of uncertainty. For example we have the following extreme fluctuations in the annual rainfall at San Francisco and at Sacramento:

San Francisco.		Sacramento.	
Season.	Rainfall.	Season.	Rainfall.
1850-51	7.40 in.	1850-51	4.71 in.
1861-62	49.27 in.	1861-62	35.55 in.

TABLE OF RAINFALL.

The following table exhibits in a striking manner the increase of rainfall as we advance northward along the Pacific coast.

Rainfall West of Sierra Nevada Mountains.

Stations.	North Latitude.	Coast or Valley.	Average Rainfall in Inches.					Extent of Record in Years.
			Spring.	Summer.	Autumn.	Winter.	Year.	
Fort Yuma	32° 44′	.....	0.25	0.68	1.49	1.04	3.46	9½
San Diego	32° 42′	Coast.	2.02	0.45	1.48	5.21	9.16	13
Drum Barracks	33° 49′	Coast.	2.93	0.60	0.30	8.00	11.83	2½
Monterey	36° 36′	Coast.	5.23	0.25	2.42	7.39	15.29	4
Fort Miller	37° 00′	Valley.	7.25	0.60	2.93	8.81	18.99	6½
San Francisco	37° 48′	Coast.	5.48	0.07	3.58	14.91	24.04	23
Stockton	37° 57′	Valley.	3.83	0.32	1.21	8.33	13.69	3½
Sacramento	38° 34′	Valley.	5.75	0.10	2.68	11.03	19.56	18
Camp Far West	39° 07′	Valley.	9.01	0.00	3.18	8.41	20.60	2½
Fort Humboldt	40° 45′	Coast.	9.36	0.73	6.50	19.33	35.92	11½
Camp Gaston	41° 10′	Coast.	13.17	1.21	12.18	35.64	62.20	4½
Fort Terwah	41° 40′	Coast.	14.20	3.30	22.16	30.27	69.93	2½
Camp Lincoln	41° 55′	Coast.	15.25	1.17	12.26	52.91	81.59	1½
Fort Orford	42° 44′	Coast.	18.26	3.11	19.92	29.30	70.59	3
Fort Umpqua	43° 42′	Coast.	16.83	2.86	15.64	32.08	67.41	6
Blockhouse	44° 25′	Coast.	26.28	2.53	31.15	36.33	96.29	1½
Fort Hoskins	45° 02′	Coast.	14.69	2.65	14.88	34.49	66.71	6½
Fort Yamhill	45° 21′	Valley.	13.10	2.39	13.20	26.90	55.59	9½
Astoria	46° 11′	Coast.	19.62	5.63	18.44	34.91	78.60	18
Fort Stevens	46° 12′	Coast.	9.14	6.54	19.12	51.02	85.82	1
Cape Disappointment	46° 17′	Coast.	14.37	7.20	23.88	29.45	74.90	2
Fort Steilacoom	47° 10′	Coast.	9.97	3.42	11.76	18.83	43.98	16
Neah Bay	48° 22′	Coast.	28.13	11.62	36.73	46.87	123.35	3½
Sitka	57° 03′	Coast.	14.51	15.66	30.99	22.23	83.39	16½

ABNORMAL DISTRIBUTION OF RAIN ON THE PACIFIC COAST.

A glance at the foregoing table reveals several remarkable and seemingly abnormal results in relation to the distribution of the rainfall along the Pacific coast. (1.) The annual rainfall augments with increase of latitude. Thus, the annual amount of rain varies from less than four inches in the Yuma and Gila deserts, at the head of the Gulf of California, to eighty inches on the coast of Washington Territory. Now it is well known, that the general law is that the average fall of rain is greatest near the equator, and diminishes as we proceed towards the poles. This law evidently depends upon the relation which the tension of the vapor at the water surfaces usually bears to the efficiency of the solar radiation incident in different latitudes. Under normal conditions, the greater perpendicularity of the solar rays, incident in lower latitudes, imparts a higher temperature to the oceanic surfaces, consequently a higher tension to the aqueous vapors contained in the superjacent air; so that an equal reduction of