

RAILWAY ACCIDENTS IN ENGLAND IN 1879.

The English papers have lately published from advanced sheets of "The Board of Trade Returns," statements of accidents for 1879. From these it appears that 1,032 persons were killed and 3,513 were injured on the railways of Great Britain during last year. On the face of the returns it would appear that accidents to trains, permanent way, &c., are far more fatal to life and limb in England than in this country, from May, 1879, to the close of April, 1880—a showing which is, it will be acknowledged, highly favorable to American Railway managers. One cause of this difference is due, probably to the fact that all the accidents are reported in England, while in this country no record is kept, or obtainable, of very many that occur.

It may be of interest to give the data concerning the accidents due to failures of rolling stock and permanent way. Of the failures in tires, 63 were engine tires, 37 tender tires, 11 carriage tires, 28 van tires, 1,088 were wagon or freight car tires, of which 888 were tires of wagons belonging to owners other than the railway company. Our readers must bear in mind that the wheels of English cars have wrought iron spokes with tires shrunk on, instead of chilled iron wheels cast in one piece as with us. Of the 1,227 tire which thus failed, 933 were made of iron and 262 of steel, while the material of 32 was not stated. Of the 496 axles which failed, 272 were engine axles, viz., 248 crank, or driving, and 24 leading, or trailing 23 were tender axles, 3 carriage axles, 190 wagon axles and 8 axles of salt vans; 76 wagons belonged to owners other than the railway companies. Of the 248 crank, or driving axles, 180 were made of iron and 68 of steel. The average mileage of 163 iron axles was 183,992 miles, and of 63 steel axles, 157,824 miles. Of the 1,541 rails which broke, 1,363 were double-headed, 130 were single-headed, 32 were of the bridge pattern and 15 were of Vignoles' section, while the section of one was not stated. Of the double headed rails, 849 had been turned; 1,225 rails were made of iron, and 316 of steel.

One peculiar feature of the English accidents is the large number happening to what are classified as Trespassers, and the large percentage of accidents to these, that prove fatal. Of the entire 1,032 killed, 308, or a little less than 30 per cent., were of this class, while of the 3,513 injured, 137, or less than 4 per cent., were trespassers. Further, the only other case in which the number of killed from any given cause exceeded the number of injured, were persons passing over railways at level crossings—30 being injured 64 killed. In the same class of casualties it appears that out of 313 servants of the company whose occupations are given, who were killed, 103, or about 33 per cent were permanent way men, and 156 of the injured, out of 1,460, or a little over 10 per cent. We have no data at hand to show the proportion of accidents in this country that came from similar causes, but we confess that these figures are a revelation to us. The track in England is more carefully guarded from intruders than with us, and yet we question if a complete record of accidents here would show any such mortality from these causes.

SLEEPING POSITION.

The food passes from the stomach at the right side, hence its passage is facilitated by going to sleep on the right side. Water and other fluids flow equally on a level, and it requires less power to propel them on a level, than upwards. The heart propels the blood to every part of the body at each successive beat, and it is easy to see that if the body is in a horizontal position the blood will be sent to various parts of the system with greater ease, with less expenditure of power, and more perfectly than could possibly be done if one portion of the body were elevated above a horizontal line. On the other hand, if one portion of the body is too low, the blood does not return as readily as it is carried thither; hence, there is an accumulation and distention, and pain soon follows. If a person goes to sleep with the head but a very little lower than the body, he will either soon waken up, or will die with apoplexy before morning, simply because the blood could not get back from the brain as fast as it was carried to it. If a person lays himself down on a level floor for sleep, a portion of the head, at least, is lower than the heart, and discomfort is soon induced; hence, very properly, the world over, the head is elevated during sleep. The savage uses a log of wood or a bunch of leaves; the civilized a pillow; and if this pillow is too thick, raising the head too high, there is not blood enough carried to the brain, and as the brain is nourished, renewed and invigorated by the nutriment it receives from the blood during sleep, it is not fed sufficiently, and the result is unquiet sleep during the night, and a waking up in weariness, without refreshment, to be followed by a day of drowsiness, discomfort and

general inactivity of both mind and body. The healthful mean is a pillow, which by the pressure of the head keeps it about four inches above the level of the bed or mattress; nor should the pillow be so soft as to allow the head to be buried in it, and excite perspiration, endangering ear-ache or cold in the head, on turning over. The pillow should be hard enough to prevent the head sinking more than about three inches.—*Hall's Journal of Health.*

ASTRONOMICAL OBSERVATIONS AT GREAT ELEVATIONS.

The progress of modern optics is now furnishing observers with telescopes of a power which exceeds the capacities of our lower atmospheres for their constant employment. The obstacles to definition due to this atmosphere have grown to be so nearly a barrier to any rapid progress, that attention has lately been given to the conditions of vision which it is very commonly supposed will be found to be best on mountain summits. There is no exact information on this subject, however, and Prof. S. P. Langley was, therefore, led to make some observations on Mount *Ætna* during a visit there in 1878, the result of which he records in the July number of the *American Journal of Science and Arts*. His object was to gather some sort of quantitative estimate of the degree of transparency and definition, to take the place of vague statement, and to give a kind of standard for comparison with sites in our own territory. The station chosen was "Casa del Busco," at an elevation of about 4,200 ft. The observations were directed to the sole end of determining the character of vision, as tested at night on stars and nebulae, and by day upon the sun. After a limited number of comparisons, he infers that at this station about nine-tenths of the light of a zenith star reaches us, and that only one-tenth is absorbed by our atmosphere. The gain on *Ætna* over a lower station, as tried by the tests of a double star observer, was more in clearness of the atmosphere than in that freedom from tremor which accompanies good definition. The latter was indeed upon the whole better than below, but not conspicuously so.

Prof. Langley concludes, as the result of his researches, that the balance of advantages for astronomical observations is most likely to be found in a dry atmosphere, and certainly at a great elevation. Such elevations have undoubtedly the advantage of diminishing the atmospheric absorption of the more refrangible rays, an absorption so important that it probably cuts off from us the larger portion of the ultra violet spectrum. The gain for observations of precision will be, though positive, not in itself probably such as to justify the difficulty and expense of such a site; but for the study of the nebulae and stellar photometry, the gain is very essential indeed, while for almost every problem in solar physics it may be said without reserve that, for rapid progress, such observations have now become not merely desirable, but indispensable. The summit of a lofty mountain, however, is not a desirable station. At an altitude of 10,000 or 11,000 ft. the observer may still enjoy all the conditions of health that fit him for labor, but beyond this unfavorable conditions increase very fast.

Quoting from his own experience of a stay of ten days upon Pike's Peak, at an altitude of between 14,000 and 15,000 ft., Prof. Langley says that at this height the attenuated atmosphere makes a long stay impossible for some, while even for the healthiest the conditions of life begin to be such as to render continuous hard work scarcely possible. At the same time the mountain condenses about itself continuous clouds, so that, except during a brief period in the autumn, the opportunities for observation are far rarer than on the plains. A dry climate and a table land, at an elevation of something like 10,000 ft., sheltered on the side of the prevalent winds by a mountain range, which precipitates their moisture in clouds that rarely advance beyond the observer's horizon, appear to be the more promising conditions in our present knowledge. Upon the whole, through the ideal station, where atmospheric tremor does not exist, and the observer pursues his studies in an ever-transparent sky, is not to be found on any part of the earth's surface yet examined, we find says Prof. Langley, within our own territory, in the dry and elevated table lands of Colorado or New Mexico, every condition which experience points out as favorable.—*Scientific American.*

SAWS.—A saw just large enough to cut through a board, will require less power than a saw larger, the number of teeth, speed and thickness being equal in each. The more teeth, the more power, provided the thickness, speed and feed are equal. There is, however, a limit, or a point where a few teeth will not answer the place of a large number.