

The Daily Astorian.

Vol. XVI.

Astoria, Oregon, Tuesday Morning, March 7, 1882.

No. 132.

THE STORY OF THE TIDES.

What They Tell of the Growing Length of the Day and of the Birth of the Moon.

From a scientific point of view, the work done by the tides is of unspeakable importance. Whence is this energy derived with which the tides do their work? If the tides are caused by the moon, the energy they derive must also be derived from the moon. This looks plain enough, but unfortunately it is not true. Would it be true to assert that the finger of the rifleman which pulls the trigger which supplies the energy with which the rifle bullet is animated? Of course it would not. The energy is derived from the explosion of the gunpowder, and the pulling of the trigger is merely the means by which the energy is liberated. In a somewhat similar manner the tidal wave produced by the moon is the means whereby a part of the energy stored in the earth is compelled to extend itself in work. Let me illustrate this by a comparison between the earth rotating on its axis and the fly wheel of an engine. The fly wheel is a sort of a reservoir, into which the engine pours its power at each stroke of the piston. The various machines in the mill merely draw off the power from the store accumulated in the fly wheel. The earth is like a gigantic fly wheel detached from the engine, though still connected with the machines in the mill. In that mighty fly wheel a stupendous quantity of energy is stored up, and a stupendous quantity of energy would be given up before the fly wheel would come to rest. The earth's rotation is the reservoir from whence the tides draw the energy they require for doing work. Hence it is that though the tides are caused by the moon, yet whenever they require energy they draw on the supply ready to hand in the rotation of the earth. The earth differs from the fly wheel of the engine in a very important point. As the energy is withdrawn from the fly wheel by the machines in the mill, so it is restored thereto by the power of the steam engine, and the fly wheel runs uniformly. But the earth is merely the fly wheel without the engine. When the work done by the tides withdraws energy from the earth, that energy is never restored. It therefore, follows that the earth's rotation must be decreasing. This leads to a consequence of the most wonderful importance. It tells us that the speed with which the world rotates on its axis is diminishing. We can state the result in a manner which has the merits of simplicity and brevity. The tides are increasing the length of the day. At present, no doubt, the effect of the tides in changing the length of the day is very small. A day now is not appreciably longer than a hundred years ago. Even in a thousand years the change in the length of the day is only a fraction of a second. But the importance arises from the fact that the change, slow though it is, lies always in one direction. The day is continually increasing. In millions of years the accumulated effect becomes not only appreciable, but even of startling magnitude.

The change in the length of the day must involve a corresponding change in the motion of the moon. If the moon acts on the earth and retards the rotation of the earth so conversely, does the earth react upon the moon. The earth is tormented by the moon, so it strives to drive away its persecutor. At present the moon revolves round the earth at a distance of about

240,000 miles. The reaction of the earth tends to increase that distance, and to force the moon to revolve in an orbit which is continually getting larger and larger. As thousands of years roll on the length of the day increases second by second and the distance of the moon increases mile by mile. A million years ago, the day probably, contained some minutes less than our present day of twenty-four hours. Our retrospect does not halt here; we at once project our view back to an incredibly remote epoch which was a crisis in the history of our system. It must have been at least 50,000,000 years ago. It may have been very much earlier. This crisis was the interesting occasion when the moon was born. The length of the day was only a few hours. If we call it three hours we shall not be far from the truth. Perhaps you may think that if we looked back to a still earlier epoch, the day would become still less and finally disappear altogether. This is, however, not the case. The day can never have been much less than three hours in the present order of things. Everybody knows that the earth is not a sphere, but there is a protuberance at the equator, so that as our school book tells us, the earth is shaped like an orange. It is well known that this protuberance is due to the rotation of the earth on its axis, by which the equatorial parts bulge out by centrifugal force. The quicker the earth rotates the greater is the protuberance. If, however, the rate of rotation exceeds a certain limit, the equatorial portions of the earth could no longer cling together. The attraction which unites them would be overcome by centrifugal force, and a general break up would occur. It can be shown that the rotation of the earth when on the point of rapture corresponds to a length of the day somewhere about the critical value of three hours, which we have already adopted. It is therefore impossible for us to suppose a day much shorter than three hours.

Let us leave the earth for a few minutes and examine the past history of the moon. We have seen the moon revolve around the earth in an ever widening orbit, and consequently the moon must, in ancient times, have been nearer the earth than it is now. No doubt the change is slow. There is not much difference between the orbit of the moon a thousand years ago and the orbit in which the moon is now moving. But when we rise to millions of years the difference becomes very appreciable. Thirty or forty millions of years ago the moon was much closer to the earth than it is at present; very possibly the moon was then only half its present distance. We must however look still earlier to a certain epoch not less than fifty million years ago. At that epoch the moon must have been so close to the earth that the two bodies were almost touching. Everybody knows that the moon revolves now around the earth in a period of twenty-seven days. The period depends upon the distance between the earth and the moon. In earlier times the month must have been shorter than our present month. Some millions of years ago the moon completed its journey in a week, instead of taking twenty-eight days, as at present. Looking back earlier still, we find the month has dwindled down to a day, then down to a few hours, until at that wondrous epoch, when the moon was almost touching the earth, the moon spun round the earth once every three hours.

In those ancient times I see our

earth to be a noble globe, as it is at present. Yet it is not partly covered with oceans and partly clothed with verdure. The primeval earth seems rather a fiery and half molten mass, where no organic life can dwell. Instead of the atmosphere which we now have, I see a dense mass of vapors, in which, perhaps, all the oceans of the earth are suspended as clouds. I see that the sun still rises and sets to give the succession of day and of night, but the day and the night together only amounted to three hours, instead of twenty-four. Almost touching the chaotic mass of the earth is another much smaller and equally chaotic body. Around the earth I see this small body rapidly rotating. The two revolve together, as if they were bound by invisible bands. The smaller body is the moon.—*Nature.*

Why no Scotchmen go to Heaven.

Long years ago, in times so remote that history does not fix the epoch, a dreadful war was waged by the King of Scotland; Scottish valor prevailed, and the King of Scotland, elated by his success, sent for his Prime Minister, Lord Alexander.

"Well, Sandy," said he, "is there ne'er a king we canna conquer noo?"

"An' it please your Majesty, I ken o' a king that your Majesty canna vanquish."

"The King o' Heaven."

The Scottish King did not understand, but was unwilling to display any ignorance.

"Just gang your ways, Sandy, and tell King o' Heaven to gie up his dominions, or I'll come myself and ding him out o' them; and mind, Sandy, ye dinna come back to us until ye hae done door bidin'."

Lord Alexander retired much perplexed, but met a priest, and reassured, returned and presented himself.

"Well, Sandy," said the king, "ha' ye seen the King o' Heaven, and what says he to oor bidin'?"

"An' it pleases your Majesty, I have seen ane o' his accredited ministers."

"Well, and what says he?"

"He says your Majesty may e'en hae his kingdom for the askin' o' it."

"Was he sae civil?" said the king, warning to magnanimity.

"Just gang your way back, Sandy, an' tell the King o' Heaven that for his civility the deil a Scotchman shall set foot in his kingdom."

Speak Up.

Will Mr. Wilcox and such intelligent, honest voters as we know him to be, come forward now and declare that no man shall represent his country in the Legislature, or in Congress, who is not dead square in favor of such legislation as will make this railroad company either build the Astoria railroad and take patents on these lands and then pay taxes on them, or give them up; if they persist in holding their claim to the lands they must pay taxes on them at all events? A little practical sense and a good square deal in politics, would cure many of these troubles. But as long as voters allow themselves to be persuaded to vote for any old granny that may be set up for office, or for any chronic office-seeker and political trickster, the people need not expect relief from the burdens of unequal laws, nor do they deserve any such relief.—*Vidette.*

For Rent.

Two splendid front rooms, suitable for offices. Inquire of Alex. Campbell.

Eastern Oysters.

Another fine lot of Eastern Oysters just received at Roscoe, per steamer Oregon. Occident block.

Sherman Bros. Express.

Will receive orders at the store of I. W. Case for upper Astoria or any other part of the city. Leave your orders on the slate and they will be promptly attended to.

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New house and first class in its appointments. Third street, in R. R. Thompson's block, opposite Capt. Ainsworth. Rooms by the day, week or month. Mrs. E. ARCTIC.

Skinny Men.

Wells' Health Renewer. Absolute cure for nervous debility, and weakness of the generative function. Sold at druggists. Oregon Depot, DAVIS & CO., Portland, Or.

Take Notice.

On after this date an additional 10 cents per cord will be charged on all orders for sawed wood not accompanied by a receipt, at Grays wood yard. July 1st, 1881.

"Rough on Rats."

The thing desired found at last. Ask Druggists for "Rough on Rats." It clears out rats, mice, roaches, flies, bedbugs, lice, boxes.

Buy the Weekly.

THE WEEKLY ASTORIAN for this week is full of just such information and news of the country as your friends in the east want to see. It has very few advertisements, and is checked to the muzzle of information that no family can successfully squeeze along without. Two dollars will buy the whole year for a year, \$1.25 for six months, or ten cents per copy.

Mothers! Mothers!! Mothers!!!

Are you disturbed at night and broken of your rest by a sick child suffering and crying with the excruciating pain of cutting teeth? If so, go at once and get a bottle of Mrs. Winslow's Soothing Syrup. It will relieve the poor little sufferer immediately—depend upon it; there is no mistake about it. There is not a mother on earth who has ever used it, who will not tell you at once that it will regulate the bowels, and give rest to the mother, and relief and health to the child operating like magic. It is perfectly safe to use in all cases, and pleasant to the taste. It is the preparation of the most skillful and experienced female physicians and nurses in the United States. Sold everywhere. 25 cents a bottle.

Peruvian Bitters.

Cinchona Balm.

The Count Cincinon was the Spanish Viceroy in Peru in 1830. The Countess, his wife, was prostrated by an intermitting fever, from which she was freed by the use of the native remedy, the Peruvian bark, or, as it was called in the language of the country, "Quinquina." Her recovery, or, her return to Europe in 1832, she introduced the remedy in Spain, where it was known under various names, until Linnaeus called it Cinchona, in honor of the lady who had brought them that which was more precious than the gold of the Incas. To this day, after a lapse of two hundred and fifty years, science has given us nothing to take its place. It effectually cures a morbid appetite for stimulants, by restoring the natural tone of the stomach. It attacks excessive love of liquor as it does a fever, and destroys both alike. The powerful tonic virtue of the Cinchona is preserved in the Peruvian Bitters, which are as effective against malarial fever to-day as they were in the days of the old Spanish Viceroy. We guarantee the ingredients of these Bitters to be absolutely pure, and of the best known quality. A trial will satisfy you that this is the best bitter in the world. "The proof of the pudding is in the eating," and we willingly submit this test. For sale by all druggists, grocers and liquor dealers. Order it. Loeb & Co., agents for Astoria.

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Have Wistar's business of wild cherry always at hand. It cures coughs, colds, bronchitis, whooping cough, croup, influenza, consumption, and all throat and lung complaints. 50 cents and \$1 a bottle.

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At Mrs. Munson's lodging house. Notice to the Public.

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New, quick, complete cure 4 days, urinary affections, smarting, frequent or difficult urination, kidney diseases, &c. at druggists. Oregon Depot, DAVIS & CO., Portland, Or.

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Is a mammoth sheet, nearly double the size of the Daily. It is just the paper for the purchaser. Located in addition to all the current news, choice miscellany, agricultural matter, market reports, etc. It is furnished to single subscribers at \$2.00 per year in advance.

War! War! War!

Water front offered free to any person that will build a saw mill in the city of Williamsport. Lumber we must have to build this city. We have one store in running order at present. Quite a number have already located homes in this city, and yet there is room. Sold on time to suit purchasers. Located one mile south of Astoria, on the sunny side of the hill, on Young's bay. J. WILLIAMSON, SR.

Various Causes.

Advancing years, care, sickness, disarrangement, and hereditary predisposition—all operate to turn the hair gray, and either of them inclines it to shed prematurely. ALEX. HAIR VIGOR will restore faded or gray, light or red hair to a rich brown or deep black, as may be desired. It softens and cleanses the scalp, giving it a healthy action. It removes and cures dandruff and humors. By its use falling hair is checked, and a new growth will be produced in all cases where the follicles are not destroyed or the glands decayed. Its effects are beautifully shown on brassy, weak, or sickly hair, on which a few applications will produce the gloss and freshness of youth. Harmless and sure in its operation, it is incomparable as a dressing, and is especially valued for the soft lustre and richness of tone it imparts. It contains neither oil nor dye, and will not soil or color white cambric; yet it lasts long on the hair, and keeps it fresh and vigorous.

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MISCELLANEOUS.

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