For the Pearl.

STANZAS TO *****.

And can it be that thus we part,
Are all our happy meetings done,
Shall we no more in converse sweet,
The foot of time make lightly run?
Wilt thou the friendly hand extend
No more, which oft I've fondly prest,
And must the feelings be forgot,
Which lit thy face and warm'd thy breast?

When we in happier hours met,
In scenes that must be ever dear;
With hearts unclouded by a care,
And eyes undimm'd by sorrow's tear:
Shall I ne'er hear one kindly word
Fall from those cherub lips of thine,
Whose winning accents once were breath'd
To charm no other ears than mine?

Then be it so: why should I weep,
Or why my spirit feel a gloom,
For one inconstant as the bee
That ranges where sweet flow'rs bloom?
The hallow'd love I've felt for thee
Can ne'er decay, still it shall dwell,
Deep hidden in my heart's recess—
My tongue its depths shall never tell.

When in the flight of changeful years,
Youth's dearest joys I shall forget,
Thy face with all its loveliness
Shall linger in my mem'ry yet,
And while the face of other friends
Shall tend to wean thy heart from me,
Each kindly word and smiling face
Shall wake my spirit's love for thee.

December 1838. *******

For the Pearl.

ON MATTER.

I beg to forward for insertion in the Colonial Pearl part of an able Essay lately read in the Lecture Room of the Colchester Literary and Scientific Society, by Adams Archibald, Esq. of Musquodoboit, which will, I have no doubt, be found interesting to the philosophical portion of your readers.

A MEMBER.

Truro, March 28th, 1839.

ON THE PROPERTIES OF MATTER AND THEIR APPLICATION TO THE PRODUCTION OF THE TIDES.

In treating of any science which is grounded upon physical facts and appearances, two courses are generally open. We may begin with a statement of the results observed, and, by gradual investigation, extricate from them the principles upon which they depend; or else, if these principles have been ascertained, we may begin by stating them, and may deduce from them the consequences which would follow on the supposition of their truth; and finally, by comparing these consequences with the appearances presented by nature, and finding them to correspond, we may satisfy ourselves of the truth of those principles which we originally assumed. The former is necessarily the course of discovery; the latter is often the most concise and convenient method of instruction, after the discovery has been made. In some cases there is little practical distinction between the two methods. For instance, the fundamental principle of hydrostatics is the equal pressure of fluids in all directions, and the fact that they do so press, is one of the first and most obvious results of observation and experiment; and, from the time that it is ascertained, the experimental and hypothetical mode of discussing the subject may very nearly coincide. In proceeding to the consideration of the subject matter of the present address, we shall take it for granted that this society is in some good degree acquainted with those properties of matter upon which the various phenomena of the tides are founded; the explanation of which is the principal object in the present address. I must, however, claim your indulgence, while I name a few of those properties which are inherent in all kinds of matter.

[Here Mr. A. proceeded to explain, in a very lucid and satisfactory manner, the principles which regulate the motions of bodies, and concluding this portion of his remarks with an enumeration of the propositions which constitute the theory of *circular* motion, he continued as follows.]

These are the theorems of circular motions, the two last of which are found by astronomers to be strictly observed by every body of the planetary and cometary system. For example, the periodical time of Venus is 225 days, and that of the earth 365; the squares of which numbers are 50625 and 133225: again, the distances of Venus is to that of the earth as 72 to 100, the cubes of which numbers are 373248 and 1,000,000; but as 50625 is to 133225, so is 373248 to 1,000,000, that is, the squares of the periodical times are as the cubes of their distances very nearly. From whence also it will easily appear that the bodies under the equator have the greatest centrifugal force, which there acts in direct opposition to gravity, and diminishes towards the poles with the squares of the distances from the earth's axis. Hence also it is evident that, if ever the earth was in a fluid state, and at rest, every part of its surface would be equidistant from its centre; but if, in that fluid state, it revolved about its axis, it must necessarily assume the figure, not of a perfect sphere or globe, but of an oblate spheriod, flatted towards both poles; as is manifestly shown by experiment; but as your time is limited, we will not be able to enter into the minutiæ of this demonstration, but merely mention the conclusions drawn from these data, which are the following; that is to say: Supposing the earth to have been in a fluid state, and at the same time revolving upon its axis, so as to make a complete revolution in 24 hours, the centrifugal force would so far have counteracted the force of gravity at the equator, as to have made the centrifugal force to gravity, as 1 to 289, and the axis of the earth to the equitorial diameter, as 229 to 230; and that if the time of its revolution, instead of 24 hours, had been but 84 minutes and 43 seconds, the centrifugal force would have then been equal to gravity: and also, that the moon's periodical revolution round the common centre of gravity, between the earth and her would, by a similar computation, be completed in 27.3-10 days. Since the earth and moon act upon each other by attraction, it is evident that, unless prevented by some counteracting force, they would meet in their common centre of gravity; but such a counteracting force is found in the fact that both these bodies revolve about that point, and preserve their distance from each other by their centrifugal forces, generated by such revolution: whence the centre of gravity—and not the centre of the earth—is that point which the moon regards in her periodical revolution; and were there no other bodies in the heavens but the earth and moon, this common centre of gravity would be at rest, or a fixed point. But, since the large body of the sun commands, by the same power of attraction, the earth and moon to revolve about himself, it will follow, that the point, which would otherwise be at rest, is that which must describe the circle, or grand orbit round the sun; because no other point between the earth and moon can keep always at the same distance from the sun, on account of the mutual revolutions of these bodies about that point at the same time that they are carried about the sun. Now, since it has been demonstrated that the power of gravity at the distance of the moon, is to that upon the earth's surface, as 1 is to 3600, and that the earth will gravitate or tend towards the moon in the inverse ratio of her quantity of matter, and that the matter of the earth is to that of the moon as 40 to 1, it follows, that the body of the earth will tend towards the moon with a force equal to 1-144000 part of the force of gravity upon the earth's surface, and that they are preserved in their orbits round their common centre of gravity by these central forces. Hence it will be very evident, considering that these forces are in the inverse ratio of the squares of the distance, that the side of the earth most contiguous to the moon, will be more strongly attracted than the centre of the earth; and also, that the centre of the earth will, in like manner, be attracted with more force than the surface of it opposite to the moon, these three different forces being as the squares of the numbers 61, 60, and 59, or as the numbers 3721, 3600 and 3481, and therefore, if the globe of the earth were a fluid mass, the surface next to the moon would be brought nearer to her, and the opposite side, being influenced by a lesser force of attraction, and a greater centrifugal force (occasioned by its revolution round the common centre of gravity at the greatest distance from that point) will be made to recede from the centre, and that the globular form of the earth will be elongated in the line of direction between the earth and moon; but, as these elevations of the water are produced by the different forces exerted by the moon's attraction upon the different parts, diminishing the effect of gravitation towards the centre, in the line of direction aforesaid, it follows that the parts of the earth's surface ninety degrees distant will, in the same ratio, approach the centre to restore the equilibrium; without which it would be impossible for the action of the moon to effect the elevations under and opposite to her. This effect is produced with great facility upon the supposition of the globe's being a fluid body throughout, but will vary with the circumstances when otherwise, and we can, from this data, easily perceive the reason why no sensible tides are to be found in freshwater lakes, although covering a large portion of the earth's surface: for let it be supposed that there is immediately under the moon, a lake, covering sixty degrees of the earth's surface, which will be over 4000 miles diameter; now it will be evident that, independently of the common argument that the time of the moon's attraction over every part of the lake's surface, are so nearly parrallel that all parts of it would be affected with an equal force, it will appear that the waters, at ninety degrees distance, by moving towards the centre, cannot communicate with the lake, nor co-operate with the moon's attraction in producing a tide under her, and consequently no sensible tides are found in fresh water lakes, but in consequence of the moon's attraction exerting its influence upon the lake and solid earth, without raising the waters upon that side of the globe next to her, it may reasonably be supposed that a greater tide will in consequence be produced upon the opposite side. What has been said with regard to the tides has been referred solely to the influence of the moon, but it will be found that the large body of the sun has (by the operation of the same law of gravity) an influence, in every particular corresponding with that law in producing the tides; but although the quantity of matter in the sun is so very great, compared with that of the moon, as to make his aggregate amount of attraction more than 100 times greater than that of the moon, yet when we consider that the tides are not produced by the total amount of attraction, but by the difference upon the different parts of the globe, inversely as the squares of the distance, and that the semidiameter or diameter of the earth when compared with the distance of the sun is but about 1-400 part of what it would be compared with the moon's distance, it will follow that the effect produced in raising the tides is not more than ½ of that produced by the moon. Hence we find, that at the time of the moon's conjunction, at the change, or opposition, at the full, we have tides produced by the united influence of the sun and moon, and these are usually denominated spring tides; but, when the moon is in her quadratures, or the sun at right angles with the line of direction between the earth and moon, his influence will then be exerted in endeavouring to produce tides under and opposite to him at ninety degrees from the tides raised by the moon; and his power being about one fourth of that of the moon, or one fifth of their joint force, it follows, that the tides raised by the moon's influence alone will then be diminished by the action of the sun, and will be but three-fifths of what they were at the full and change of the moon, and these are called neap tides. These effects would be uniform at the same places, if the surface of the globe were covered with water, and the plane of the ecliptic were coincident with that of the equator, and the plane of the moon's orbit round the common centre of gravity between her and the earth coincided with that of the ecliptic, which that common centre of gravity describes round the sun, and that the ecliptic, as well as the orbit of the moon, were perfect circles; but as these hypotheses are all at variance with the facts, and it is ascertained that the surface of the globe exhibits land and water in every possible variety of form and location, and that the axis of the earth being inclined to the eliptic about 23° 29′, causing the equator to form a similar angle with the ecliptic, and the moon's orbit intersecting the ecliptic in two points called the moon's nodes, and forming an angle with it of 5° 17′, and that the ecliptic, as well as the moon's orbit round the earth, is in the form of an ellipse, varying the distance of these bodies from each other in describing the different parts of their orbits respectively, we therefore find that the tides vary much in the same places, and at the same times of the moon's periodical revolutions, according to the moon's obliquity, or its contiguity with respect to the earth and sun, and that the highest tides take place in northern latitudes, exceeding the greatest degree of the sun's and moon's declination, on that side of the earth immediately under the moon, when the sun and she have attained their greatest northern declinations, and, because the opposite tides are then as far south of the equator, as the sun and moon are north of it, the next tide will be produced by the influence of attraction operating obliquely in an angle with the perpendicular, double of that of the sun and moon's declination, and that, when the tides are referred merely to the moon's influence, the tides in the hemisphere over which she is vertical in the night, will be higher than the following day tide, which has frequently been matter of speculation and inquiry; but, as this cannot take place in its fullest extent by the sun and moon in conjunction, excepting at the change, when both bodies may be vertical on the tropic of Cancer, upon the 21st of June at mid-day, the night tide will then be the least, or less than the day tide, at that place, or in any place north of the equator in that meridian; and the greatest possible tides occur when the perigee of the moon, or her least distance from the earth, concurs with the preceding circumstances at the time of the full or change of the moon, and also when these circumstances happen when the earth is in or near the perihelion of the ecliptic, when the greatest possible force of attraction, exerted upon the earth by both sun and moon, in consequence of their proximity, prevails.

To be continued.

POETRY AND STEAM.---In an interesting paper in the Musical World, entitled "Words for Composers," Leigh Hunt says:---Beautiful, truly, is it to see what noble poets we have had in these latter days, and with what abundant glory they have refuted the idle fears of an extinction of imagination in consequence of the progress of science! Fancy steam putting out the stars! or the wheels of the very printing-press running over and crushing all the hearts, doves, and loves in Christendom! for till you did that, how were you to *put out* POETRY? Why the printing-press and the steam-carriage are themselves poetry---forms, made visible, of the aspirations of the mind of men; and they shake accordingly the souls of those who behold them. See the rotary mystery working in the printing-room---the unaccountable and intangible god, Fire, giving it force against the old negative deity, Time. See the huge, black, many-wheeled giant, the steam-carriage, smoking over the country like some mammoth of a centipede, and swallowing up that other ancient obstacle, Space---and Time with him! and then suppress, if you can, those very thoughts of human good, and eternity, and the might and beauty of the universe, which it is the most poetical office of poetry to keep alive and burning.

Walchius thought it possible to contrive a trunk, or hollow pipe, that should preserve the voice entirely for certain hours, or days, so that a man might send his words to a friend, instead of his writing.