Mill, so far ar we can judge from his autobiography, seems never to have had a mother, and his education during the whole of the first heptades, was unnoticed.

The world will never outgrow universities. America has not too many colleges. It is not indicative of breadth, or of originality, to be harping on the one note, that American colleges ought to be concentrated into a few universities. This would greatly diminish the number of students. Few who proclaim that doctrine give any evidence of having thoroughly studied the subject. On the law of supply and demand, some of them will improve, some modify their character, some disappear. Not coercive or restraining, but encouraging efforts are needed, and rapidly; whatever be the demand, it will be supplied.

If the principle which we have laid down is correct, all can see the bond of connection between colleges and our public schools of every grade. They are all engaged largely in one work,—to make the most of manhood. Not simply to pile up an objective mass of information, but to give to their pupils power to create and power to employ.—(*New-England Journal of Education.*)

Terrestrial Magnetism

If a magnetized steel needle is suspended by its centre of gravity, or placed upon a point, it will take a determinate direction towards a point of the horizon which is very nearly north and south. The force which produces this direction is called terrestrial magnetism. It is one of the modes of manifestation of the natural sources of electricity, since magnetism itself is only a particnlar form of electricity. The magnetic force of our globe is manifested at its surface by three classes of phenomena, namely, the declination of the magnetized needle, its inclination, and the intensity with which the force acts. The declination is the angle that is formed with the direction of the meridian of the place by the direction of the magnetized needle placed upon a vertical pivot. The inclination is the angle that is formed with the horizon in the magnetic meridian by the direction of a magnetized needle sustained by its centre of gravity, around which it is able to turn freely in a vertical plane. These three elements, declination, inclination, and intensity, not only vary from one place to another, but in the same place with time. They also manifest irregular and accidental variations, designated under the name of disturbances, the existence of which is connected with the presence of some natural phenomena, such, in particular, as that of the aurora borealis. It is well established that the forces which act upon the magnetized needle emanate directly from the terrestrial globe, and we are naturally led to regard the earth as a great magnet, and as having one pole situated to the north of us, attracting the north pole of a needle in that direction.

If we suspend a magnetic needle by its centre of gravity, so that it may move freely either in a vertical or horizontal plane, the extremity which turns towards the north will incline below the horizon, making at New York an angle with the horizon of about 72 degrees. Hence we conclude that, if the earth be a great magnet, giving direction to the needle, its pole must be situated, not on the north horizon, but almost vertically beneath us.

If the earth be really a magnet, the magnetism of soft iron ought to be decomposed by it, in the same manner as is done by a bar magnet, and such is the fact. If a bar of soft iron is held in the direction which a magnetic needle assumes when freely suspended, its lower end immediately becomes a north pole, and its upper end a south pole, as is shown by bringing a small magnetic needle near each end of the bar. On inverting the bar, it will be found that its poles have immediately changed, the lower end being again a north pole, and the upper one a south pole. If the bar is held horizontally, pointing east and west, no such effect takes place.

A similar but slightly diminished effect is produced on a bar of iron suspended in a vertical position; and iron rods which have remained long in a vertical position frequently acquire permanent magnetism.

When a bar of iron is rendered magnetic the influence of terrestrial magnetism, as a stroke of a hammer will sometimes fix the magnetism, and the poles will not be reversed when the bar is inverted. But if several blows with the hammer be struck when in the inverted position, its magnetism may be destroyed or its poles be reversed.

The action exerted by the earth upon a magnetic needle is simply to give direction to the needle, for the weight of the needle is not increased by its magnetism. Hence it is concluded that the attraction of the earth for one pole of the needle is exactly equal to its repulsion for the other. If a magnetic needle be placed upon a cork floating on water, it will soon adjust itself to the magnetic meridian; but it has no tendency to travel either towards the north or south.

Although a magnetic needle, when fully suspended, generally points nearly north and south, it is found in almost all parts of the world that the north pole of the needle deviates a few degrees from the astronomical meridian. This deviation is called the magnetic declination.

The declination is said to be east or west according as the north pole of the needle deviates to the east or west of the true meridian. The declination of the needle is very different at different places on the earth's surface. There are places where the declination is 10, 20, 30, and 90 degrees west; and there are places where the declination is as much to the east. At most places on the earth's surface, the dipping needle will not rest in a horizontal line, one pole pointing downwards and the other upward. This dip varies at different places from 0 to 90 degrees, and observations to determine its amount have been made in almost every part of the world. In order to represent all these observations conveniently upon a chart, a line is drawn connecting all those places where the dip is the same. A line connecting all those places where the needle rests horizontally is called the magnetic equator. This line exhibits numerous sinuosities in its course around the globe, but does not depart much from a great circle. It crosses the terrestrial equator near the western coast of Africa, attains its greatest southern latitude in south America, where it is 15 degrees south of the geographical equator, crosses the equator again near the meridian of New Zealand, and attains a north latitude of 12 degrees near the southern part of Hindostan.

As we travel northward from the magnetic equator, the north end of the needle inclines downward, and the dip continually increases at the rate of about 1 degree for 1 degree of latitude, nntil we reach the north magnetic pole, where the needle stands vertically, in latitude 70° 5, N., longitude 95° 45, W.

As we travel southward from the magnetic equator, the south end of the needle inclines downward, and this dip continually increases until we reach the south magnetic pole.

That terrestrial magnetism is not produced, in any important degree, by magnetic forces external to the earth is probable, because, if there were an external cause for magnetism, it is scarcely conceivable that some large part of it would not act in places parallel to the