## The Cause of Attraction.

The Rev. Father Seechi, the learned director of the Roman Astronomical Observatory, has just published an essay, in which he discusses from an advanced point of view the theory of attraction. After having shewn, in accordance with the views so ably expounded by Mr. Tyndal in his paper on Force, (published in the Naturalist, p. 241,) that all the physical forces or movements of which we are cognizant come to us from the solar centre, the learned Jesuit inquires. "But how does this movement or series of movements return to the sun? Who knows but that part of the heat thus emanating from the sun, which is not lost by radiation into space, is converted into an impulsion of the mass of the earth towards the sun? I do not pretend to give a theory, but only to propose a conjecture, which it will be sufficient for me to shew not to be absurd."

"We see that the intensity of heat, like that of gravity diminishes inversely as the square of the distance. We know also that a prodigious quantity of molecular movements come from the sun by luminous and carlorific radiation, and under the form of vibratory disturbances, remain apparently destroyed, at the earth's surface, instead of being lost by radiation towards the planetary spaces. In fact, heat coming from sources of a very high temperature (that is to say, heat of short undulations) when brought to a lower temperature (or to long undulations,) can no longer traverse the terrestial atmosphere and radiate into space. A certain quantity of motion coming from the sun must thus rest imprisoned in terrestial bodies, by the chemical force to which it gives rise. So that in reality the vis viva, and the quantity of movement in the terrestial globe, and its surrounding mass of ether, must increase indefinitely, if there were not some way of escape or discharge. Why may not this discharge be the incessant fall of the earth towards the sun, a fall expressed by the linear distance which the earth deviates from the tangent of its orbit : which tangent the earth would follow in virtue of its inertia, did not some cause draw it towards the solar centre ?"

Of this brilliant and novel conjecture, the learned editor of *Le Cosmos*, from whom we extract the above, remarks, that it seems to be one of those happy inspirations which belong to truth alone; and he adds, "there is great merit in having originated an idea which has never before presented itself to the human intelligence, and which, in time to come, may bring forth fruitful results."—*Le Cosmos, Nov.* 21, 1862.—*From the Canadian Naturalist.* 

## The Age of the Pyramids of Egypt.

Mahmoud Bey, astronomer to the Vice-Roy of Egypt, has just published the results of his investigations of the pyramids, undertaken at the request of the Vice-Roy. The measures of the great pyramid he finds to be 231 meters for the sides of the square base, and 1465 metres for the height; so that the faces form an angle of  $54^{\circ}$   $54^{\circ}$  with the horizon. This agrees with the known inclinations of the six other pyramids of Memphis; which vary between  $51^{\circ}$  and  $53^{\circ}$ , and average  $52^{\circ}$   $30^{\circ}$ . This common inclination; and the fact that the pyramid and the other funeral monuments which surround

them, are, as Mahmoud has satisfied himself. always placed exactly facing the cardinal points suggests that these pyramids had some relation to a celestial phenomenon, and to the divinity which presided over that in the Egyptian mythology. Now he has found that Sirius, when it passes the meridian of Gizeh, shines vertically upon the southern face of the pyramids; and in calculating the change in the position of this star for a series of centuries, shows that 3,300 years before the Christian era, the rays of this star, at its culmination, must have been directly perpendicular to the southern face of the pyramids, inclined at an angle of 52° 45' with the northern horizon. According to the principles of astrology the influences of a star are greatest when its rays fall perpendicularly upon an object. If now we suppose that these pyramids were constructed a little more than 5,000 years ago, it would appear evident that their faces received the angle of 52 degrees, in order to be perpendicular to the rays of Sirius, the brightest star of our northern heaven; which was consecrated to the god Sothis, the celestial dog, and the judge of the dead, and was also said to be the soul of this deity.

This opinion is confirmed in an unexpected manner by the following considerations. The pyramids, being tombs or funereal monuments. would naturally be under the patronage of that divinity who presides more particularly over the dead, that is to say with Sothis, who is no other than the thrice-great Hermes, Cynocephalus, Thoth or Anubis. Now the hieroglyphic designation of Sothis is a pyramid by the side of a star and a crescent. Nothing is therefore more natural than this relation thus descovered by Mahmoud Bey between Sirius and the pyramids. The date of 3,300 B.C., thus assigned to these structures, accords with Bunsen's determination, according to which king Cheops reigned in the thirty-fourth century before our era, It also agrees with the tradition of the Arabs, according to which they were constructed three or four centuries before the deluge ; which they assign to the year 3,716 before the Hegira.—(Le Cosmos, Nov. 21st, 1862).—Ibid.

## Whitworth Shells,

The new shells of J. Whitworth, of Manchester, England, which penetrated the iron target at Shoeburyness, have been patented and are described as follows :- The shells are made solid in front of the cavity, to give them sufficient strength for penetration. No fuse is employed ; the heat generated in the front part of the shell by the impact of the metal is sufficient to ignite the charge inside. The material of which the shell is made, is "homo-geneous metal"-a low carbonized steel. It is formed into bars, then cut into lengths, each of which is sufficient to form two shells; these are then carbonized to the depth of half an inch, to render them hard on the surface. They are then divided and bored internally and turned externally as follows:-Each shells, and afterwards case-hardened as follows:-Each shell is placed in an iron box and surrounded with animal charcoal, cuttings of horns and hoofs, the box covered, placed in a fire and raised to a red heat. The shell is now withdrawn from the box, set up upon its end, and cooled by allowing several jets of cold salt brine

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