evidence in favour of the origin of species by a process of evolution; it seems natural then, to view existing elements not as primordial, but as the gradual outcome of a process of development. The analogy here suggested is not very close, and must not be pushed too far. From the nature of the case there cannot occur in the elements a difference between living and fossil organic forms. The earth, the geologists manual, can tell us nothing of the extinct elements, however rare, like a rare plant or animal on the verge of extinction; or that any new element is in process of formation or that the properties of the existing elements are gradually undergoing modification. All such changes must have been confined to a period so remote as not to be grasped by imagination, when the matter of which our earth now consists was in a state very different from its present condition. Making allowance for these distinctions, if evolution be a cosmic law, manifest in heavenly bodies, in organic species and individuals, we shall in all probability recognize it, though under special aspects in those elements in which the stars and organisms are composed. Is there any direct evidence of the transmutation of any supposed element of our existing list unto another? We are obliged to answer in the negative. The highest temperature and the most powerful electric currents at our disposal have been tried in vain. Even if we leave the laboratory and observe the processes in nature we feel no sufficiently firm ground. We find ourselves driven to indirect evidence—to what we may glean from the mutual relations of elementary bodies. A manufactured article may be well supposed to imply a manufacturer. But it does something more, it implies raw material; and probably the existence of products, residues, etc. What or where is here the raw material? Can we detect any form of matter which bears to the chemical elements a relation like that of raw material to the finished product? Or can we recognize any elementary bodies which seem like waste or refuse? Are all the elements as equal? Such are the questions we would have with our readers. Summing up all considerations, we cannot venture to assert positively that our so called elements have been evolved from one primordial matter; but we may contend that the balance of evidence fairly weighs in favour of this speculation.

C.

SCIENCE COLUMN.

The Province of Physical Science.

In its broadest sense Physical Science includes the study of inanimate and animate nature, even extending its influence into the more intangible regions of Intellect and Spirit. A writer in the "*Fortnightly Review*" is anxious to have its functions limited to the investigation of 'matter and force' as he understands these terms. He looks upon the experimental study of 'matter' and 'force' as a subordinate office as he apportions that duty to Cinderella, and he hopes Cinderella will be content to remain in the kitchen and perform her work without interfering in higher concerns. No doubt this was meant only as a retort to Prof. Huxley's sarcastic allusion to Philosophy and Theology which he had represented in a previous article as Cinderella's twin-sisters quarrelling upstairs while the latter worked in the kitchen.

The analogy is not very instructive, but it places Mr. Lily's contention (for this is the name of the writer to whom reference has been made) in a vivid light. It is the intention in the present article to attempt to point out how Mr. Lily is wrong in desiring to place this cast-iron limit to the domain of Physical Science. If there be boundaries, they should be definable from his stand-point and should have been marked out with an accuracy which would leave his readers and disputants in no uncertainty as to the territory he is willing to yield the despised Cinderella, who he seems to forget afterwards became a princess. He speaks very lightly of matter and force as if everyone would distinctly understand what a critic will readily perceive is his opinion regarding these ideas. As to 'matter' little need be said, although what it means is surely not yet satisfactorily demonstrated, but at the out-set when we come to speak of 'force' it is plain that its definition must vary if we accept Mr. Lily's reasoning. He ignores the so-called 'vital force' which though little understood is none the less a force or more correctly energy. Were it not some form of energy—most likely the most complex of all—it could not perform such wonderful functions—assimilation, perception &c.

Mr. Lily's definition of the boundary lines of the province of Physical Science consists chiefly in attempting to prove that Prof. Huxley is a materialist whether the latter is willing to acknowledge it or not, and he bases his evidence upon the opinions expressed by Prof. Huxley at various periods of his life. Taking for granted that Prof. Huxley's opinions have never changed, Mr Lily has probably made good this ground, but that he has made clearer the limits of Physical investigation, is not by any means certain. One thing is certain, and Mr. Lily will no doubt give his assent, that notwithstanding all the batteries, lines of circumvallation, fortifications and implements of warfare, modern and mediæval, which hostile criticism may place opposed to it, Experimental Science will pursue its course with ever increasing enthusiasm, and the success of the past is but the earnest of a more glorious future.

It might appear that I have been overlooking the particular phase of the subject which the writer wishes to present. He is anxious to fix the boundary only between Physical Science on the one hand, and Philosophy and Theology on the other. He would have us believe that Science has no concern with the spiritual part of man, as well might he say that the soul dwells in the body inde-