SCIENCE:

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PROFESSOR TAIT, in a recent number of *Nature* (Nov. 25, 1880), directs attention to the necessity of perfect definiteness of language in all scientific work. "Want of definiteness," he says, "may arise from habitual laziness, but oftener indicates a desire to appear to know, where knowledge is not."

It is also claimed that scientific writers, even of the present day, have not that clear comprehension, which is essential, of what is subjective and that which is objective, and thus much confusion arises. To use Professor Tait's own language, our only source of information in physical science is the evidence of our senses. To interpret truly this evidence, which is always imperfect and often wholly misleading, is one of the tasks set before reason. It is only by the aid of reason that we can distinguish between what is physically objective and what is merely subjective. Outside us there is no such thing as noise or brightness; these no more exist in the aerial and ethereal motions, which are their objective cause, than does pain in the projectile which experience has taught us to avoid. To arrive at the objective point of Professor Tait's article, we may state that it involves a disagreement between himself and Mr. Herbert Spencer, as to the real meaning of certain words, and the propriety of making use of them on occasions which are mentioned.

In one of his works, Mr. Spencer states that, "Evolution is a change from an indefinite, incoherent homogeneity, to a definite heterogeneity, through continuous differentiations and integrations."

Mr. Kirkman translates the foregoing into "plain English," or as Professor Tait rather profanely asserts, "strips it of the tinsel of high flown and unintelligible language," thus:

"Evolution is a change from a nohowish, untalkaboutable, all-alikeness, to a somehowish and ingeneral talkaboutable not-all-alikeness, by continuous somethingelsifications and sticktogetherations."

Mr. Spencer claims that the explanation of the meaning of the word "Evolution" is a formula. Professor Tait calls this "a definition;" hence the difference of opinion, the latter asserting it to be not a mere quibble of words, but that an important scientific distinction is involved, to which the attention of the scientific world is directed.

The perusal of a communication from Professor Asaph Hall, of Washington, which will be found in this column, will greatly assist those who desire to solve the question. Professor Hall does not enter into any details of the controversy, but offers "*an illustration*" which appears to strike at the root of the matter in dispute.

We think that Mr. Spencer may rest satisfied with applying the term "*definition*" to his form of words, for by the rule presented by Professor Hall, it is evidently straining a point to assert that in them we find "a *formula*," using that word in the same sense as when we speak of the law of gravitation.

By the law of gravitation astronomers are able to predict the positions of known celestial bodies four years before the event, and Professor Tait asks if Mr. Spencer, with his "formula," can predict, four years before hand, the political and social changes which will happen in the history of Europe.

AN ILLUSTRATION.

In regard to the controversy between Professor Tait and Mr. Herbert Spencer, I beg to offer the following illustration. If we take by chance the three numbers 11, 12, 13, and form their squares, we have

$$(11)^2 = 121$$
$$(12)^2 = 144$$
$$(13)^2 = 169$$

Now take the numbers with the figures in an inverted order, and we have,

$$(11)^2 = 121$$
$$(21)^2 = 441$$
$$(31)^2 = 961$$

We see that the figures of the squares are also inverted; and this holds in the case of three consecutive numbers. We infer therefore that this is a general law in the formation of square numbers. Arguments of this kind might have an extended application in various branches of science; but if we make further examination we soon find numerous exceptions to our