

Now, of these forces, light and sound require special organs for their perception. These organs are adapted for the reception of a limited number of vibrations, beyond which there is no sound for the ear nor light for the eye; the ear hearing no sound of less than 8 or more than 38000 vibrations per second, while the limits of vision are 458,000,000,000,000 of the extreme red, and 727,000,000,000,000 of the extreme violet vibrations per second.

In the words of Prof. Rice, who has long and diligently examined this question: "Tones and colors are essentially the same things. Colors are tones of tremendous height of pitch. Tones are colors of tremendous depth of pitch. From the most acute tone capable of being perceived by the ear, to the extreme red color, there is an interval of about thirty-four octaves. To give an illustration of the enormity of such an interval, let us take the length of the string of the highest C of a seven and a quarter octave piano, which is about $1\frac{1}{2}$ inch, and it will be easy to calculate that a string of the same material and thickness, in order to produce the extreme red light would have to be cut down to about the $\frac{10,000,000,000}{100,000,000,000}$ of an inch!"

Rapidity of vibrations, then, is the means by which we distinguish colors from tones, light from sound. But rapidity of vibrations constitutes not an essential, but merely an accidental difference; and therefore sound and light do not differ essentially from each other. Let us apply this conclusion to a vibrating body, a steel rod, for instance. Suppose the steel rod is made to vibrate, we first hear a sound: if the vibrations are increased beyond a certain limit, they disappear as sound but become perceptible as heat: this is evident, for we have seen by the experiments of Joule and Hirn that heat and motion are equivalent, wherever there is motion, there also heat can be found. Now if the heat be increased, that is if the rod vibrates still more rapidly, it glows, and finally becomes incandescent, demonstrating practically our conclusion by giving us light.

In treating of the unity of natural forces, I have made no mention of electricity. My reason is, that the intrinsic nature of electricity, the latest of nature's gifts, is as yet but little known. Electricians of the present day do not seek for its essence, but look for new applications. But does it not seem probable that in the near future, it will be reduced to the same principle as the other forces; inasmuch as it is closely allied to them, since by electricity we may produce sound, heat, and light? Having considered this tendency of the reduction of natural phenomena to unity, and its progression to its present development, we will conclude by noticing briefly its effects upon the human mind.

In the 17th and 18th centuries there were two camps in the Christian world. On the one hand were those who bowed to the sceptre of the Roman Pontiff; arrayed against them were numerous sects, who, though at variance amongst themselves, were nevertheless

united in one great object,—the destruction of the Catholic Church. To day the scene is somewhat different. We still behold the two camps, but, strange to say, side by side we see the former combatants; and their opponents are those who, when they cannot perceive God in the field of view of their telescopes, or fail to touch him with the scalpel, unite on the great principle—the absolute negation of God.

What is the cause of this? I answer, the false progress occasioned by some, who, perverting their God-given talents, forced on by their pride, invent pet theories, and seeing these adequate to the explanation of some phenomena, conclude therefrom concerning all, crying out: "See! the universe is governed by such and such laws; that planet moves in its orbit in accordance with such and such regulations; those chemicals combine and form a new compound in obedience to such a formula; in fine we ourselves are but the development of the great law of progress. What need then, is there of a God, useful only in frightening old women and children?"

Such is the talk of our modern infidels, whose minds so long prone to matter, are unable to rise to any lofty, any noble conceptions. Now have we a remedy for this great failing? Most assuredly we have. Unity we have said, gives perfection, but perfection is Truth, and Truth is God; therefore, as we cannot have unity without God, the perfection of science can be had only through those teachings which see God in all, beholding Him even in the dust on which we tread,—the teachings of scholastic philosophy. Our aim then in science should be to keep always before us the great principle that what denies God cannot give unity, for God and Truth cannot conflict.

By pursuing this end we will show that the words uttered by Louis Veuillot in a moment of ill-humor: "The nineteenth century is altogether one of alembics smoke, and machines," are not at all applicable; for we have in our science a knowledge of God—THE ESSENCE OF UNITY.

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From the census recently taken of the religious persuasions of the Irish people, we learn that the Catholic Church and the several denominations are rated thus: Out of a total population of 5,159,849 there are 3,951,885 Catholics; 635,670 members of the Protestant Church of Ireland; 485,503 Presbyterians; 47,669 Methodists. The decrease in Catholics and Protestants was about equal in the ten years—4.8 per cent. The Presbyterian decrease was but half, or 2.4 per cent. The Methodists have increased 4,228, 9.7 per cent. Of the other population of the country, 76.6 are now Catholics, 12.3 are Protestant Church of Ireland, 9.4 Presbyterians, and 0.9 Methodists; while the Baptists, Quakers, and other denominations make up between them 37,515 individuals. Of the total number of 485,503 Presbyterians in Ireland, 466,107 are in Ulster, and of these 190,749 are in the county Antrim.