DR. HAANEL'S ADDRESS.

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more toward a continuous spectrum, which is reached when the solid state is attained; and, further, we can see why each elementary sau stance in the form of incandescent vapor has a definite, different spectrum, since the spectrum may now be supposed as depending on the grouping and number of the ultimates constituting an atom.

The perfect coincidence of the vibrations of incandescent hydrogen upon the earth no matter how obtained, with that observed in any c lestial body which is known to contain it, the perfect definiteness and invariability of its combining weight, no matter from what source the Hydrogen be extracted, be it in m meteoic iron, or from some kind of coals deposited ages ago in the carboniferous age, show it to be constructed upon one pattern, one type-its configuration is permanent, and this ho as equally true with all the rest of the well established elements. We cannot avoid the conclusion of Sir John Herschel, that this uniformity and invariability are marks of a manufactured articleit was created, and it must be admitted with Clerk Maxwell, the illustrious physicist, " that in the case of molecules, each individual is permanent, there is no generation and no variation, or rather no difference between the individuals of each species Hence the kind of speculation with which we have become so familiar under the name of theories of evolution is quite inapplicable to the case of molecules." If then we accept the nebular hypothesis, we must at least start with these manufactured molecules. The time may not be far distant when the spectroscope will famish material aid to research in the domain of molecular physics, when we shall be enabled to make out connections between the wave lengths of the bright lines of the metals and their atomic weights. We may even hope that molecular physics will be reduced to an exact science, so that from its data we shall be able by mathematical deduction to arrive at the properties of matter.

The case of heat is so similar to that of light, that whatever in the structure of atoms is capable of explaining the emission of light waves will also explain the emission of heat waves.

. But we may yet derive a further argument for the compound constitution of our atoms from the late development in molecular science arrived at by the joint labours of Kroeng, Clausius, an i Clerk Maxwell. The dynamic theory of gases maintains, that the molecules of a gas are in a state of rectilincal motion. As ing in all directions at a calculated velocity of 17 miles per minute, through the space the gas occupies, having their directions continuously altered by collisions with each other, and producing pressure by striking against the sides of the containing vessel. It might indeed at first sight appear strange to you, that we should be able to sustain unharmed a bombardment of the molecules of this air moving at the rate of 17 miles per minute We can do so, remarks Clerk Maxwell "only because the molecules happen to be flying in different directions, so that those which strike against our back. Indeed, if this molecular bombardment were to cease, even for an instant, our

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