

of atmospheric vapor, a large amount of the ultra-red rays would assuredly be restored to the solar spectrum. This conclusion has been recently established on the grandest scale by Professor Langley, who on the 10th of September wrote to the lecturer from an elevation of 12,000 feet on Mount Whitney, "where the air is perhaps drier than at any other equal altitude ever used for scientific investigation." An extract from Professor Langley's letter will fitly close this summary: "You may," he says, "be interested in knowing that the result indicates a great difference in the *distribution* of the solar energy here from that to which we are accustomed in regions of ordinary humidity, and that while the evidence of the effect of water vapor on the more refrangible rays is feeble, there is, on the other hand, a systematic effect, due to its absence, which shows, by contrast, its power on the red and ultra-red in a striking light. These experiments also indicate an enormous extension of the ultra-red rays beyond the point to which they had been followed below, and being made on a scale different from that of the laboratory—on one indeed as grand as nature can furnish—and by means wholly independent of those usually applied to the research, must, I think, when published, put an end to any doubt as to the accuracy of the statements so long since made by you, as to the absorbent power of water-vapor over the greater part of the spectrum, and as to its predominant importance in modifying to us the solar energy."—*Proceedings Royal Society.*

Use of Petroleum as Fuel in Russia.—Upon the Balachan-skoi Railway the locomotives are heated with crude naphtha, which is introduced into the tender as it comes from the wells, and there have been no accidents resulting from its use. All the ships upon the Caspian Sea are heated exclusively with the liquid combustible, the cost being only half as great as that of coal. Experiments which have been made upon some of the railways show that a kilogramme of naphtha is equivalent to $8\frac{1}{2}$ kilogrammes of wood, although the theoretic heating power is only three times as great. The use of petroleum with injectors for introducing it into the furnaces is very convenient—the combustion can be regulated with the greatest ease; the furnaces last much longer on account of the absence of sulphur; there are no cinders, smoke or sparks, and the work of the stokers is greatly simplified.—*Soc. des Ingen. Civils.* C.