you the economy of chemistry. I have shown you that it takes substances apparently repulsive, and converts them into industrial utilities. We only imitate Nature in this respect. She allows nothing to be wasted in the universe, but always converts the refuse materials into substances useful to man. When you see Nature thus cherishing her waste materials, and carefully using up all effete, decaying, and putrid matter for great purposes in the economy of the universe, you will not be inclined to think that the economy of chemistry in converting waste substances into industrial utilities, is either ignoble or repulsive, or that the subject itself was unworthy of being brought before you.

Miscellaneous.

THE NEW METAL THALLIUM.

Properties of Thallium.

Thallium has all the characters of a true metal, and, in most of its physical properties, greatly resembles lead. Not quite so white as silver, it possesses a briliant metalic lustre when freshly cut. It appears yellowish when rubbed against a hard body; but this tint is doubtless due to oxidation, for the metal precipitated by a battery from an aqueous solution, or fused in a current of hydrogen, is white, with a bluish grey tinge, which resembles aluminum.

Thallium is very soft, and very malleable; it can be easily scratched by the nail, and cuts with a knife. It marks paper, leaving a yellowish streak. Its density (11·9) is a little higher than that of lead. It fuses at 290° C., and volatillises at a red heat. Lastly, thallium has a great tendency to crystalise, for the ingots obtained by fusion crackle like tin when they are bent. But the phyisical property, *par excellence*, of thallium,—that which according to the beautiful researches of MM. Kirchhoff and Bunsen, characterises the metallic element,—that which led to its discovery,—is the property which it possesses of communicating to the pale gas-flame a green colour of great richness, and to the spectrum of this flame a single green ray as distinct and as sharply defined as the yellow ray of sodium, or the red ray of lithium. On the micrometric scale of my spectroscope, this ray occupies the division 120·5, that of sodium being at 100. The slightest portion of thallium, or of one of its salts, gives the green line with such brilliancy that it seems white. The fifty-millionth part of a gramme can, according to my calculations, be recognised in a compound.

Thallium tarnishes rapidly in the air, becoming covered with a thin pellicle of oxide, which preserves the rest of the metal from alteration. This oxide is soluble, is decidedly alkaline, and has a taste and smell similar to potash. By this characteristic, as well as by its optical properties, thallium approaches the alkaline metals.

Thallium is attacked by chlorine, slowly at the ordinary temperature, rapidly at a temperature above 200° C. The metal then melts, becomes incandesent under the action of the gas, and gives rise to a yellowish liquid, which solidifies on cooling to a mass of a little paler colour.

Natural State and Extraction.

Thallium cannot be considered as very rare in nature. It exists, indeed, in many kinds of pyrites, which are used at the present time in large quantities, principally for the manufacture of sulphuric acid. I may especially mention Belgian pyrites from Theux, Namur, and Philippeville, I have also found it in mineralogical specimens from Nantes and Bolivi, in America.

Strictly speaking, thallium might be prepared from these pyrites; but it is much easier to prepare it by using the deposits from the lead chambers, where it accumulates in relatively large quantities during the manufacture of sulphuric acid. It is from these thalliferous deposits that I have extracted, by a method given in my memoir, the chlorides of Thallium which formed the starting-point of the study which I have made of the new metal and its compounds.

As to the metal itself, it may be reduced from one of its saline combinations either by the decomposing action of an electric current, or by precipation with zinc, or by reduction with charcoal at a high temperature. The chloride may also be separated from its chlorides by potassium or sodium under the influence of heat; in this latter case the reaction is very energetic.—*Chemical News.*

Consumption of Tea in the World.

The following figures show the present annual consumption of tea, approximately, or as near as can be arrived at:

	Lbs.
China	1,408,000,000
United Kingdom	78,000,000
British America and West Indies	3,000,000
Australia, the Cape, &c	7,000,000
British India	3,000,000
United States	35,000,000
Russia	15,000,000
France	550,000
Hanse Towns, &c	150,000
Holland and its Colonies	3,200,000
Belgium	200,000
Denmark, Sweeden and Norway	250,000
Germany	500,000
Spain and Portugal	200,000
Italy	50,000
South America	500,000
Other places	500,000
	1,555,100,000

The immense traffic in tea is one of the most remarkable illustrations of the enterprise and energy of modern commerce. The trade in tea now gives employment to upwards of 60,000 tons of British shipping, and about £10,000,000 sterling of British capital, producing a revenue to the State of £5,500,000 sterling. Of all foreign imports, tea is the most important in Russia, and the whole of this comes to the fair of Nijnie Novgorod, with the exception of the very small quantity of sea-borne tea which is brough to Odessa. The middling classes make a more frequent use of this beverage than the rest. The declared official value of the tea introduced into Russia is about £1,500,000 sterling.—*London Grocer.*