culiar name; and, having consulted with several of the eminent and ingenious chemists of this country, I have been induced to give it the name of Columbium.

Tantalum

EXTRACT FROM A MEMOIR on the Properties of Yttria Earth Compared with those of Glucine; on the Fossils in which the Former of these Earths is Contained; and on the Discovery of a new Substance of a Metallic Nature. By A. G. Ekeberg. Published in The Philosophical Magazine, Vol XIV. London (1802).

THE FIRST PART of this memoir contains an account of some experiments, made by M. Eckeberg, to establish the difference between glucine and the earth discovered in the gadolinite, and called yttria or gadoline; but as the peculiar nature of each of these earths is already well known to chemists, it is here needless to repeat what has been already said on that subject.

As the other is interesting on account of its novelty, we shall lay before our readers the observations made on it by the author.

Though the mineral substance I discovered, says he, contains yttria, it could not be classed in a system of mineralogy as a species of earth, on account of the more abundant mixture it contains of another substance equally remarkable, and which must increase the class of metals, already very numerous. I found this substance in two fossils, obtained from different places; in one of them, it was united with iron and manganese; and in the other, with the former of these metals and gadoline.

This new metallic substance is distinguished by its insolubility in all acids. The only re-agent which has any action on it is caustic fixed alkali. When subjected to heat with this alkali, if the mass be then lixiviated, it partly dissolves in the water, and suffers itself to be precipitated from that solution, by means of an acid—but without the precipitate being in any manner attacked, whatever be the quantity of the acid employed. When separated by the filter, and dried, it remains under the form of an exceedingly fine white powder, which does not change its colour even at a red heat. If the remaining mass be treated with acids, the same powder is obtained. Its specific gravity, after being brought to red heat, is 6.500. It is fusible by the blowpipe, by the addition of alkaline phosphate and borate of soda, but communicates no colour to the flux.

Exposed to a strong heat in a crucible, without any other mixture than pounded charcoal, it is reduced to a button moderately hard, having some metallic splendour at its surface, but a dull blackish fracture. Acids have no other action on this kind of regulus, but that of bringing it to the state of white oxide in which it was before. The circumstances of the reduction, as well as the specific gravity of this singular substance, seem to assign it a place among the metals, and I have sufficient reasons for being persuaded that it is none of those already known. The substances with which it might be confounded are the oxides of tin, tungsten, and titanium, which are soluble in caustic alkalies, and which, under some circumstances, resist acids. But the oxide of tin is easily dissolved and reduced: tungsten immediately discovers itself by its solubility in ammonia, and by the blue colour which it communicates to phosphate of soda: the oxide of titanium gives a hyacinth colour to borax, and becomes soluble in acids by fusion with carbonate of potash.

Before I describe the chemical analysis which I undertook of the two substances, which I consider as ores of the new metal, it is proper I should give a description of their external characters. In order to avoid circumlocution, when necessary to name them I shall venture to give them a generic denomination. Taking advantage of the usage which admits mythologic appellations, and to express the property which the new metal has, of not becoming saturated with the acids in which it is immersed, I shall apply to it the name of *Tantalus*. For the ore composed of tantalus, iron and manganese I propose the name of *tantalite;* and for the ore containing yttrie, that (*Turn to next page*)

ENGINEERING

Pipe Filled With Sodium Used As Conductor of Electricity

FOUR-INCH iron pipe filled with the unstable metal sodium is a novel conductor of electricity that has been giving satisfactory service for several years in an electrochemical plant at Midland, Mich. It carries as much as 4000 amperes of current, a job that is almost universally done by copper.

The late Dr. H. H. Dow made the installation in an effort to prove that sodium could be used to better advantage than copper to conduct large direct currents, R. H. Boundy told the Electrochemical Society. Mr. Boundy believes that even now, with copper at its present low cost, use of the sodium conductors would be justified for certain installations.

Although the resistance of sodium is three times that of copper, it weighs only one-ninth as much as the familiar electrical conductor. Hence, to carry the same amount of current, a sodium conductor has to be almost three times as large in cross-sectional area as one of copper. But a yard of the sodium conductor would not be nearly so heavy as a corresponding length of copper.

Sodium is one of the widely distributed of metals. A common form in which it occurs is table salt, chemically known as sodium chloride. The metal will not exist in nature as the uncombined element because air quickly tarnishes it and water readily reacts with it. As the pure metal, it is soft and silvery, with low melting point.