as a body of established doctrine, not a shifting guesswork. In the same number of *NATURE*, in the review on the "Origin of Coral Reefs", the word is systematically perverted—it almost always is. I go among schoolmasters advocating scientific method: How am I to hold up my head when, in using words, my tribe is so careless? We weigh things to the *n*th decimal—but rarely our words. Cannot we do something by way of example, so that our youth may not always 'babel on'? We have yet to learn to serve up our dish of science with proper trimmings.

Even the word 'science' has no established meaning. In the introduction to his recently published all-comprehensive "History of Science", Mr. W. C. D. Dampier-Whetham tells us that the English word science is used as a shortened term for natural science, though the nearest German equivalent, *Wissenschaft*, still includes all systematic study. Surely, this is wrong. 'Science' is 'the business of knowing'; the production of knowledge; truth of whatever kind. What some of us are trying to do is to exclude from it unnatural knowledge, as was the desire of the early founders of the Royal Society.

HENRY E. ARMSTRONG.

Early Rhodesian Gold.

THE preliminary report by Miss Caton Thompson and the letter from Prof. J. W. Gregory (*NATURE*, Nov. 9) are of great interest to students of history. It is well to bring forward the contradictory evidence, as Prof. Gregory has done. In regard to the estimate of a gold production, in ancient or medieval days, amounting to £75,000,000, I venture to express a warning. The production and disposal of any such quantity of gold would have made a big stir at any time in the world's history. Its commercial value in medieval days, or earlier, would be, at least, twenty times its present value, and an addition of the equivalent of £1,500,000,000 to the world's wealth would be a great event, would it not? We have no whisper in historical records of any such contribution coming from the gold mines of any region before the Californian and Australian discoveries. The Spaniards obtained most of their South American gold from the graves, not the mines, of Peru, Colombia, and Venezuela. Again, £75,000,000 in gold represents a weight of 625 tons.

As a mining engineer, informed concerning the Rhodesian mines, I beg to submit that the estimates made by Edwards, Hammond, or others should not be accepted by archaeologists, because they were made at a time when the Rhodesian diggings were being boomed on the London stock exchange. Such estimates have no value for the historian. The removal of 100,000,000 tons means the excavating of a vast number of cubic feet of rock; Where is the evidence of such extensive work?

As to the ingot found in Falmouth harbour; we have no evidence as to its Phœnician origin; the statement by Diodorus concerning the *astragalos*, or knuckle-bone, pattern has nothing to do with the Phœnicians; he is referring to the tin trade of his own day, that is, about 25 B.C., when the tin was carried overland from Corbilo, at the mouth of the Loire, to Massilia, at the mouth of the Rhone. I have examined the Falmouth relic and I have seen a soapstone mould of a supposedly same type in the Bulawayo museum. They have nothing in common. The Falmouth ingot has a shape evidently suited for convenience in packing on horseback across Gaul. We have no proof that the Phœnicians mined Cornish tin or went thither to obtain it; on the contrary, the evidence suggests that they traded with the

Veneti, or their predecessors, at the mouth of the Loire, where, in Morbihan, they themselves mined for tin, and probably also traded with the Britons, meeting them on the island of Ictis, as described by Diodorus. The supposed identity of ingot moulds is to be taken no more seriously than the idea that phallic emblems necessarily signify Phœnician operations at Zimbabwe.

T. A. RICKARD.

Faculty Club,
University of California,
Nov. 25, 1929.

DR. RICKARD's letter carries the weight of his high authority on early mining. Yet the estimates of the great gold output from Rhodesia were not made on the London Stock Exchange, but by responsible mining engineers who were well acquainted with the ancient workings. When discussing Telford Edward's estimate with the local authorities in 1905, they expressed the view that his figure would have to be increased owing to the discovery of many additional workings. In view of the size and number of the ancient mines, I felt that the excavation from them of 100 million tons was not exaggerated. The workings are direct evidence of an output of gold which, as Dr. Rickard says, would have made a stir in the world. The discoveries at Ur and in Egypt show that the people of those countries had tons and tons of gold. If the Rhodesian gold mining had been medieval, we should surely have evidence of it in the gold or by tradition.

In view of the suggestion that the gold was mined in connexion with the Arab settlement of the East African coast, I recently asked Sir Robert Hamilton whether he knew of any evidence of the Arabs there having had any large quantities of gold. He replied: "I have seen and myself collected a few gold and gold-inlaid ornaments on the coast; some, the majority, were obviously not very old, being made out of sovereigns; others were older, these mostly from Lamu and Patta, which generally appeared to be of Persian origin or design. In any case the amount was trifling. On the other hand, old swords and daggers, which are often treasured possessions, are generally hilted and adorned with silver work of Arab origin. While there are traditions of wealth in ivory and slaves, I have never come across traditions of wealth in gold or of trading in gold, and so far as my reading of history goes I do not recollect any recorded accounts of the early European discoverers and explorers on the E. coast finding the Arabs in possession of wealth in the shape of gold nuggets, dust, or ornaments. The evidence is naturally defective and negative, but I should hesitate to believe that the medieval coast Arabs possessed gold in any quantity without a great deal more positive and convincing evidence than I have yet seen."

In reference to the Falmouth tin ingot, the stamp on it has been described as the mark of a Phœnician or Greek trader. The ingot was accepted as Phœnician by the best opinion of the time of its description by Sir Henry James, for Lord Leighton, who was careful to obtain the best expert advice, pictured it in his fresco in the Royal Exchange of the Phœnicians trading with the ancient Britons. Dr. Rickard remarks that this ingot and the Zimbabwe ingot-moulds have nothing in common. Their similar shape seemed to me so significant that I published outline drawings of them, to show their resemblance, in *Trans. Inst. Min. Eng.*, vol. 31, 1905-6, Pl. I. Figs. 2 and 3. The loss of the ingot near the entrance to Falmouth Harbour was attributed by Sir Henry James to the boat having been wrecked while seeking shelter there "on its voyage coastways to Boulogne".