

The remaining addresses given by Planck are mostly replies to those of newly admitted members of the Academy. This kind of thing is a remarkable feature of the Berlin Academy. They discuss things which others either ignore or leave to philosophers. Einstein, on admission, discoursed on the analysis of fundamental temporal and spatial concepts, among other things. Planck replied in characteristic fashion, and his attitude (this was in 1914) to the principle of relativity rather reminds me of Carl Neumann's attitude (1869) to the principles of Galileo and Newton. For Planck, the relativity principle was, one feels, something that replaced Newton's *spatium absolutum*, or Neumann's body *Alpha*. He was less of a revolutionary than Einstein and never interfered with the existing structure of physical theory, or with physical concepts, until the facts and logical necessity forced his hand.

There are specimens of Planck's handwriting—in German script, which he always, or mostly, used—in the form of proposals for election to the Academy of Rubens (1907) and von Laue (1920). The former is signed by Nernst, among others, and the latter by Rubens, Nernst and Einstein, and both of them, of course, by Planck himself.

Lastly, there is an article by Arnold Sommerfeld, written in honour of Planck for his sixtieth birthday, April 23, 1918, which appeared in the journal *Die Naturwissenschaften*. Its special interest lies in its discussion of Planck's work and of the nature and growth of the quantum theory by one of the greatest of German theoretical physicists, and in its numerous biographical details.

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1016

## CURRENCY OF PRIMITIVE PEOPLES

### Primitive Money

In its Ethnological, Historical and Economic Aspects. By Paul Einzig. Pp. 517. (London: Eyre and Spottiswoode (Publishers), Ltd., 1949.) 25s. net.

MORE than half this book consists of very short précis of data on 'primitive money' from ethnographical and historical literature, to supply a basis for a theoretical analysis of "What is Primitive Money?", "The Origin of Money", "The Value of Primitive Money", "Primitive Monetary Policy", and "The Philosophy of Primitive Money".

The précis of data strike a modern anthropologist as being uncritical and in the mode of the less able anthropologists of the end of the last century. Data are cited as snippets of customs, torn from their context of the economic and other social processes, on the analysis of which modern anthropologists concentrate. Judging by the précis from literature I know well, or on areas where I have done field research, this method of collecting data is barren even for the present subject, which is largely unfamiliar to me. This part of the book is useful to an anthropologist only as an index, rather full if not complete and unfortunately not evaluated, to an extensive literature. Too many books and articles are used without any judgments on their worth. Economists unacquainted with primitive systems may learn something from this section, but only if they can appreciate the implications of the limitations of a subsistence economy. Here these are barely set out on pp. 457-58.

I also learnt little from the theoretical sections, save that, judging by Dr. Paul Einzig's quotations,

economists speculating about primitive money need to be given an empirical training. Dr. Einzig also requires this. His whole section on "The Origin of Money" is cast in a form no longer used in anthropology—speculations based on assumptions about human nature. One example must suffice. "Human nature being what it is, there must always have been a natural desire to compare the size of the wealth of one chief against that of another chief. Unless they kept their wealth in precisely the same form there could be no comparison without the use of some form of common denominator in terms of which the various forms of wealth could be expressed for the sake of comparison" (p. 367). This kind of statement should be backed with empirical data. Dr. A. I. Richards contradicts its assumptions when she reports that she never heard a Bemba chief boast to another of the quantities of food he had, but only of the number of people he fed. South African chiefs had no idea of the quantities of their cattle; but they knew the size of their following.

Dr. Einzig in these analyses makes many equally incorrect assumptions, as that the Tierra del Fuegians and other moneyless folk are of "a low standard of intelligence". Psychologists have shown that it is probable that all groups of *Homo sapiens* have the same general intelligence.

The section on "The Value of Primitive Money" sets out problems which few anthropologists have studied, and I was amused by the application of Gresham's law to the cattle-keeping tribes of Africa. Dr. Einzig takes their cattle as currency, and since they are reported to prefer quantity to quality, he cites this as bad money driving out good. In fact, the choice arises only in modern times, when land is limited; in these conditions, many poor cattle are accepted as preferable to a few good ones. But meantime, another currency has been introduced; and, in fact, few tribes own cattle beyond their needs for diet. Again, this part of the book may warn economists to examine the problem of primitive money empirically; they will gain far more instruction for their task by reading a book like Firth's "Primitive Polynesian Economy".

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1016

## ELASTICITY AND ANELASTICITY OF METALS

### Elasticity and Anelasticity of Metals

By Clarence Zener. Pp. x+170. (Chicago: University of Chicago Press; London: Cambridge University Press, 1948.) 4 dollars.

WHEN metals are submitted to stress, the stress/strain relation is generally regarded as consisting of two parts, the elastic region and the region of plasticity in which a permanent set remains upon the removal of the stress. In the elastic region the absence of a permanent set does not necessarily imply that the relation between stress and strain is linear or even single-valued. Prof. Zener uses the term 'anelasticity' to describe the properties of solids, as a result of which stress and strain are not uniquely related. Examples are the elastic after-effect, the dependence of elastic constants on the method of measurement, and the dissipation of energy during vibration, which is often referred to as the damping capacity or internal friction of a solid. These effects