protest were entered against a practice which is altogether indefensible, more particularly since those to whom such qualities are attributed are unable to defend themselves.

When the charred remains of human bones are found on some Pleistocene hearth it is generally at once assumed that those who were responsible for their condition were cannibals. Is such a find evidence of cannibalism? Possibly not. But when it is added that the bones so found are cracked in such a manner as to indicate that the marrow was extracted by some human agency, who can deny that these fossil humans must have been cannibals? I submit that denial or affirmation is here a matter of scientific impossibility, but I would also point out that under conditions of scarcity modern primitive peoples, who by any standard could hardly be called cannibals, have been known to kill their young and feed them to those who were left. Is it not also true that under similar conditions highly civilized men have been known to do the same? And are they therefore to be characterized as cannibals? The point need not, I think, be pressed. The consumption for occasional ritual purposes of certain parts of the human body is a practice which is to be found among many primitive peoples to-day, but no people of whom we have any knowledge makes a habit of cannibalism. In fact, cannibalism is a pure traveler's myth.

My friend, Dr. G. H. R. von Koenigswald, has recently endowed the fossil Pleistocene men of East Java discovered by him with the quality of being brain-eaters. The evidence for this he finds in the fact that in each of these skulls the facial bones were completely broken away by some human agency. He assumes, therefore, that the human agents were desirous of securing the brain for gastronomical purposes. This is certainly a possible inference, but is it a probable one?

Reading recently in Herbert Basedow's delightful "The Australian Aboriginal" (Adelaide, 1929, p. 95), I came across the following paragraph:

"The Narrinyerri and other tribes south of Adelaide used human calvaria as drinking vessels. *The facial skeleton of a complete skull was broken away so as only to leave the brain-box; and this held the water.*" (Italics mine).

I leave the eduction of the proper relation to others.

Java is, of course, very near Australia. Let the ethnologist who will, swoop with delight at what he may take to be the persistence of a culture-trait in Australia of to-day which was already in existence in Pleistocene Java. Or shall we say that we have here a case of independent invention? The physical anthropologist will place a finger upon his *alar nasi* and point to the Australoid characters of the Javanese fossil crania. The reader may remark, "How interesting."

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SCIENTIFIC BOOKS

ELECTRICITY

Electricity. By W. L. BRAGG. The Macmillan Company. 1936.

THE first thing to make clear about this book is that its author is not W. H. Bragg, whose reputation for excellent exposition is already world-wide, but W. L. Bragg, his son, whose writings thus far have consisted largely of treatises and of accounts of his own researches and those of his school in the field of crystal analysis by means of x-rays. (No physicist needs to be told that in this field he was one of the pioneers and to this day an outstanding figure.) Had I been prompter in writing this review, I should have described him as professor in Manchester University; now I can add that he is the new director of the National Physical Laboratory.

The book originated from a course of six lectures "adapted to a juvenile auditory" at the Royal Institution, and consists of six chapters entitled: What is Electricity?, How Electricity Travels, Motors and Dynamos, Our Electrical Supply, Telegraphs and Telephones, Oscillating Electrical Circuits [mostly wireless]. The juvenile auditory is exhibited in the frontispiece, and as one reads along in the book one comes to comprehend the expression of intent concentration which their faces wear: it must have been a wonderful experience to be able to watch, while hearing Bragg's exposition, the actual demonstrations which here must be translated into words. I must add that the translation is often well done, some of the experiments being described so plainly that one is tempted to follow the author's advice and try them for one's self.

The book is far from being an account of electron-theory; electricity is introduced by describing the ancient and the classical experiments up to and through the time of Faraday, and electrons and atom-models are described in hardly more than a casual fashion, just before the author enters upon the description of electrical apparatus. I find it strange to see lines of force so emphasized, even to the extent of explaining the spreading of charge over a conductor as due to the repulsion, not of the elementary charges but of the lines of force for one another. Millikan's method of measuring the electron-charge is mentioned (though with the unfortunate implication that the oil-drop

picks up free electrons only) but not the value of the electron-charge nor any way of measuring the electron-mass—unless I have carelessly overlooked something. The electron thus remains rather vague, and little is said about the atom-model, except for one brilliant simile which affords a welcome relief from the sun-and-planet's image: Bragg compares the model with "someone's head with a cloud of mosquitoes around it."

The chapters on motors, dynamos and electrical supply are interesting, informative and not always easy. We learn from the preface that "I have tried to judge how deeply I might go into the various subjects by remembering the questions I was asked after the lectures. If parts of this book seem unduly difficult, it is because these questions gave me so high an opinion of the intelligence of the rising generation." This being the case, I should think that mathematical formulae need not have been entirely avoided. If, however, formulae must be avoided, I doubt whether alternating-current phenomena can be better treated than they are in Bragg's book. The descriptions of such types of apparatus as the dynamo, the alternating current meter and the Creed teleprinter are well done. I hope, however, that the rising generation does better by the interpretation of contact potential difference than I have. I do not venture to comment on the chapters on telephony and radio, lest my comments be thought to be based on fuller knowledge than I possess.

The illustrations, both sketches and photographs, are numerous and excellent. The book is well printed and pleasant to read. Misprints are remarkably scarce, and the only confusing passage I have found is that on page 143, where "sheet" is used to designate sometimes one and sometimes the other of two electrodes. The style is conversational, not to say chatty, and now and then delightfully jocular. "Why do electrons [enable metals to reflect light]? Because they are electrified particles and react to light according to certain laws. Why do electrified particles obey these laws? At this stage we are reduced to saying in an exasperated way: *Because they jolly well do.*" "... Our description of the flow of current is just the opposite to the actual flow of electrons. Perhaps the following analogy will clear up the puzzle. Suppose I take the spare cash in my pocket and hand it over to you. Ought I to say that a current of riches has passed from me to you, or that a current of poverty has passed from you to me? (Unfortunately in the case of the electric current it was as if everyone agreed to say the current of poverty passed from you to me.)" "When we remark 'It wasn't what he said but the nasty way he said it,' we are unconsciously distinguishing speech on the one hand from the larynx noise on the other hand, which latter is largely responsible for conveying emotion apart from words."

KARL K. DARROW

BELL TELEPHONE LABORATORIES
NEW YORK

SOCIETIES AND MEETINGS

ACTIVITIES OF THE PHOENIX LOCAL BRANCH OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE Phoenix Local Branch brought to a close its third year of activities on the fifteenth of April, with its twentieth lecture of the season.

A meeting of the board of councilors was held on September 20, at the Arizona Museum. The nominating committee presented its list of candidates, and ballots were sent out accordingly. The officers elected for the ensuing year were: A. L. Flagg, *President;* Dr. John A. Lentz, *Vice-president;* with Professor J. W. Hoover, Claude E. McLean, J. E. Thompson and Odd S. Halseth as members of the board to serve for four years.

The branch was without a secretary nearly the entire year, as Mr. Halseth, the second secretary, resigned at the September board meeting. The board has recently prevailed upon Mr. Alfred E. Knight, a past president of the American Institute of Science of New York City, to act as secretary-treasurer. Mr. Knight brings to the Phoenix Branch his wide experience in doing successfully the things we hope to do in Phoenix. We are very fortunate to have him cooperate with us.

The series of lectures sponsored by the Phoenix Local Branch during the season just closed was well received. The total attendance at twenty lectures amounted to 1,194. A wide range of subjects was covered: Archeology, astronomy, chemistry, geology, geography, mineralogy, ornithology, physics, plant pathology and zoology. Some lectures were illustrated. The attendance of students from the high school and junior college should be mentioned, for it is from these sources that the future workers in the fields of science must come. The interest shown in the whole lecture series indicates clearly that there is a demand for such programs and the active members feel encouraged to continue this work.

Qualified speakers are within reach. Our experience has shown that appreciative audiences will attend scientific lectures if proper publicity is given. Therefore, we look forward to a better ordered and more successful year of service to the community during the season 1937–1938.

A. L. FLAGG,
President, Phoenix Local Branch