first marked salmon that have been recovered each season have been caught on Swiftsure Bank and in the region of the Strait of Juan de Fuca. Therefore, these results, together with those of the commercial fishery, show that the adult sockeye salmon migrating into the Fraser River each season are native to it and come from the open sea, where they have matured.

Mr. G. B. Kelez in his studies of the coho salmon (*O. kisutch*) of the Puget Sound region has found a similar relationship in the commercial catches of these salmon, and from his marking experiments, data unpublished, has found that they are native to the streams of the region.

Another good example of the migrations and homing of the Pacific salmon may be found in the studies of the pink salmon (*O. gorbuscha*) of southeastern Alaska. This part of the territory is composed, for the most part, of a group of large islands known as the Alexander Archipelago. There are over 900 streams in this region, which range in size from mere trickling creeks to large rivers. Practically all these streams support populations of pink salmon. Many are only a few hundred feet apart at their mouths and flow into bays. Others are more or less isolated along the shores of inlets. As many as 25,000 pink salmon may be found spawning each year in creeks not more than a few yards in width and a half mile in length. The areas in the bays and inlets influenced by the fresh waters of these streams are so small that it would be impossible for more than a few salmon to mature within them, let alone thousands of fish. Furthermore, no half-grown pink salmon have ever been found within the inside waters among the islands throughout the entire region. Nor are any adult pink salmon found within these waters except during the season of the spawning migration, which extends from June to October.

Salmon traps are operated by the commercial fishery along the shores of the main channels of entry into the inside waters among the islands. Since these traps are stationary units of gear, the time of appearance of the salmon runs in the channels may be determined readily from the time in the season the trap catches are made. Records of the daily catches of these traps have been collected for a period of 20 years. There has never been a year when some of these traps were not set prior to the beginning of the salmon runs. The first traps to catch pink salmon each season have been invariably those located near the entrances of the channels into which the salmon migrate from the open sea. Observations in the offshore waters shortly before the pink salmon begin their migrations into the channels have revealed the presence of these fish in large schools milling about but gradually moving towards the shore.

That these pink salmon return to their parent streams in southeastern Alaska is also not a matter of conjecture. In the spring of 1931 I marked 50,000 pink salmon fry by removing two of their fins at a small stream flowing into Olive Cove on Etolin Island.[6] This stream is more or less isolated from other pink salmon streams in the district. The adult salmon bearing the marks returned to Olive Cove in the summer of 1932. At this time a search was made in all the neighboring streams for marked salmon, but none were found. This would indicate that there is a high degree of homing in the pink salmon. However, I have not assumed that this would be true of all streams, for from my studies of the return of marked pink salmon to the Duckabush River on Hood Canal, Washington, I found there was a certain degree of straying from the parent stream.[6] The Duckabush River is located on the canal between and within a few miles of two other streams of similar size. Marked adult pink salmon were found in both of the neighboring rivers, but the great majority of the returns were to the parent stream. Hence it is not improbable that the pink salmon populations in streams more or less isolated from other streams may show little tendency toward straying, whereas populations in streams in the vicinity of other streams may show some degree of straying into the neighboring streams. Furthermore, I am not aware of any biologists at the present time thoroughly familiar with the life histories of the Pacific salmon who are of the opinion that any of the species return to their parent streams with unerring accuracy. The studies of Dr. A. L. Pritchard on the homing of the pink salmon[7] as well as my own studies indicate that the homing of these salmon is of a sufficient degree to justify conservation measures on the basis of the parent stream principle.

The practical application of this principle in the conservation of all the species of Pacific salmon has given most satisfactory results. The U. S. Bureau of Fisheries has records to show that the protection of the salmon populations in individual streams has brought about a great increase in their abundance and that when this protection is removed the populations again decline in abundance. In view of the evidence both from the practical as well as the scientific standpoints the Bureau of Fisheries is firm in its conviction that this principle is sound both in theory and practice.

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CANNIBALISM AND PRIMITIVE MAN

QUALITIES are often attributed to fossil men which, upon the evidence offered, would in any Primate court of justice be considered actionable. It is time that a

[6] See F. A. Davidson, *Bull.* U. S. Bur. Fish., 48: 15, 1934.

[7] A. L. Pritchard, Ann. Rept. Biol. Bd. Canada, 1933.

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