Broom. I do not intend here to enter into a general discussion of the position of this interesting fossil, but wish merely to protest emphatically against its dismissal as "merely a chimpanzee." Certainly, of living anthropoid apes, the chimpanzee is the only one with which a comparison might possibly be made. Both Professor Dart and Dr. Broom, however, have pointed out many features in which this specimen differs from this living form. Direct comparison of the fossil with chimpanzee skulls of a similar degree of development renders it obvious that *Australopithecus* is specifically distinct, and generic distinction seems almost equally certain.

New light is now shed on the subject through the fact that Professor Dart has skilfully disarticulated the jaw, revealing the dentition in its entirety. A study of the teeth suffices to render the assignment of *Australopithecus* to the chimpanzees absolutely out of the question. The vertical position of the incisors as contrasted with the forward slope of those of the chimpanzee has been discussed by Dart and Broom. The canines are small as compared with the milk molars; these teeth are much larger than those of the chimpanzee and in their size, shape and structure appear to be outside the possible range of variation of that genus and, in fact, resemble more closely the human type.

Attempts to settle the phylogenetic position of *Australopithecus* might best be postponed until the publication of Professor Dart's monograph on the skull. But in the meantime it can not be too strongly emphasized that *Australopithecus* is not a chimpanzee, but a new and separate type of anthropoid ape, worthy of careful consideration in any discussion of higher primate phylogeny.

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STRIATED COBBLES FROM TEAY VALLEY, WEST VIRGINIA

THE occurrence of striated cobbles and boulders in regions south of the glaciated area has been discussed recently by Wentworth.[1] In examining gravels in Teay Valley, West Virginia, during the past summer the writer found striated cobbles in a new locality, and since their presence here sheds additional light on the origin of such cobbles and also on the problem of the diversion of the Kanawha River from its old course through Teay Valley, it is desired to put the facts on record.

Teay Valley has long been recognized as an abandoned river valley, having been first brought to attention by I. C. White in 1884 and described in some detail a few years later by G. F. Wright. In 1903 W. G. Tight discussed it in detail, showing its relation to other preglacial drainage lines. It is now generally accepted to be the abandoned channel of the Kanawha River, which deserted this northwesterly course for its present northward course.

Teay Valley is about a mile wide and thirty-five miles long, extending from St. Albans to Huntington. The Teay formation, which consists of gravel grading upward into finely laminated clay, was deposited in this valley. The striated quartzitic cobbles, ranging in diameter from two to ten inches, were found in exposures of the gravel in cuts made by the Chesapeake and Ohio Railroad about three miles east of Milton.

Three possible origins for striated cobbles south of the margin of continental glaciation have been suggested.[2] The lithology, location and association of the cobbles in the Teay formation make the hypothesis of intense valley ice action the most plausible explanation for their striation.

In order to explain the character and distribution of the clays of the Teay formation, Campbell[3] has suggested that local ice dams existed for some time, causing the ponding necessary for the Teay River to seek the new course now occupied by the Kanawha, and also deposition of the laminated clays. Striated cobbles here lend support to the ice dam hypothesis in that it indicates ice action in Teay Valley at the time the Teay formation was deposited.

A more detailed description, with illustrations of the cobbles, will be published elsewhere.

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THE NATIVITY OF THE PUMPKINS

VARIOUS opinions have been expressed as to the nativity of *C. pepo* and *C. moschata,* our cultivated pumpkins. Some botanists regard them as of American origin and others as native to eastern Asia.

Since the plant has never been found in its natural habitat the subject has been one of speculation based upon certain terms of inexact meaning. Recently, however, there has come to light through the activities of the archeologists a rich store of material which throws important light on this subject. In the recoveries from the Cliff Dweller ruins fragments of the rind and peduncle in an excellent state of preservation have been secured and in the mortuary bowls seeds of cucurbits are found, the taxonomic characters of which are clearly defined. This material is

[1] C. K. Wentworth, "Striated Cobbles in Southern States," *Bull. Geol. Soc. Am.*, 39: 941–954, 1928.

[2] *Op. cit.*, p. 948.

[3] M. R. Campbell, SCIENCE, n.s., 12: 98–99, 1901.

now in the Peabody Museum of Harvard University and was collected by Messrs. Kidder and Guernsey. Also, in the Colorado State Historical Museum, are found specimens recovered by Dr. Paul S. Martin. The writer has been privileged to study these collections and finds numerous specimens of *C. moschata* and *C. pepo*. In the instance of the Peabody collection, some of the specimens are quite ancient. According to Kidder they are from the Basket Makers, a culture antedating the Cliff Dwellers, and are regarded by him as belonging to the period 1500 to 2000 B. C.

Interesting material of a similar character has come to light in the explorations made by Mr. Neil M. Judd under the direction of the National Geographic Society at Pueblo Bonito, New Mexico. In this material fragments of stems and seeds are found which are identified by Dr. C. V. Coville as *C. pepo* and *C. moschata.*

From the Everglades of Florida Dr. John K. Small has collected a plant of unknown origin which is running wild and is known as the Seminole Indian pumpkin, a variety of *C. moschata.*

In the Guadalupe Valley of southern Texas occurs a cucurbit closely related to *C. pepo* which appears to be indigenous. L. H. Bailey collected specimens in its natural habitat which he identifies as *C. texana.*

The fact that *C. pepo* and *C. moschata* are indigenous to North America seems clearly established. The nativity of the third species, *C. maxima,* the squashes, is still in the dark, and we are in hopes that the archeologists may in time be able to throw light upon this subject also.

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STARLINGS IN OKLAHOMA

THAT the starling this winter invaded the state of Oklahoma may be of interest to some ornithologists and zoologists. The starlings have not been reported before this year for this state, but appeared in considerable numbers in Tulsa County in December, 1929, as reported by Miss Edith Force, of the Tulsa city schools. The birds appeared on the campus of the University of Tulsa at different times during the three weeks of cold weather beginning January 10. During this period, there was a snowfall of about twenty inches, and the thermometer reached the zero mark at different times. On the night of January 13, amidst a storm of snow and sleet, a starling flew through an open window of one of the dormitories where it was caught and identified the next morning. Dr. R. D. Bird, of the department of zoology, Oklahoma University, says that starlings appeared on the state university grounds and in the vicinity of Norman, Oklahoma, at the same time they were seen at Tulsa in January. The starlings left the above-mentioned communities when the cold weather broke up, during the first week in February, and so far as the writer knows, no one has observed them in this locality since.

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SCIENTIFIC BOOKS

Operational Circuit Analysis. By VANNEVAR BUSH, Eng.D., professor of electric power transmission, Massachusetts Institute of Technology. With an appendix by Norbert Wiener, Ph.D., assistant professor of mathematics, Massachusetts Institute of Technology. John Wiley and Sons, Inc., New York; Chapman and Hall, Ltd., London, 1929.

IT is now nearly fifty years since Heaviside introduced the shorthand operational methods associated with his name for the solution of circuit problems arising in telegraph and telephone engineering. The adoption of these methods by engineers has been relatively slow. This has been due partly to a lack of a compact, orderly exposition of the methods and partly to a natural aversion to the intellectual labor of mastering a novel discipline which appeared to offer a less rigorous alternative to classical methods which had to be mastered in any case as a preliminary to the understanding of the new tools. Those who were only occasionally faced with such problems could scarcely be expected to make an attempt at such a mastery.

The great expansion of the field of communication engineering in the last twenty-five years and the applicability of its results to other fields (notably acoustics) have, however, forced an intensive development of the mathematical tools available, in which increasing attention has been paid to the Heaviside methods so that a considerable literature now exists. The present work is, however, the first attempt to embody the subject in text-book form.

Professor Bush is to be congratulated on the success with which he has performed his task. The superposition theorem, the integral theorem and the expansion theorem are developed in a manner to bring out clearly their interrelations and their relative contribution to the direct operational procedure. The fundamental grounding of the Heaviside methods in the Fourier analysis and their relation to the