

These do not occur similarly in adjacent sound wood.

There had been such a prevalent opinion among pathologists that heart-rotting fungi are not truly parasitic, because of the commonly accepted assumption that the heartwood is dead, that White took pains to show that such views were erroneous. After discussing evidence to be drawn from the "wound gum," he continues, "Tyloses fortunately do not suffer such variant opinions; they can be produced only by living cells. Their occurrence, then, proves that the invaded tissues are living . . . The tyloses arise as the result of a stimulation primarily induced by the fungus." (p. 163.)

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A PREHISTORY CHART

Professor A. E. Jenks, of the Department of Anthropology at the University of Minnesota, has designed a chart illustrative of the chronological sequences of archeological periods in prehistoric Europe and of typical artifacts of each period. The dimensions of this chart are three feet by four feet. The upper half is devoted to a chronological diagram of culture sequences in which the various glacial advances are represented by peaks and the interglacial periods by valleys. The associated cultures are distinguished by the varied colors of the different portions of this Pleistocene range. The several types of fossil man have their positions in the landscape indicated by guide posts.

The lower half of the chart shows drawings of characteristic implements of the successive periods, excellently delineated and clearly labelled. The selection of artifacts representative of the Paleolithic periods is very good. Limitations of space prevent an equally satisfactory display of objects characteristic of the Neolithic, Bronze, and Early Iron Ages. Nearly all of those represented on the chart come from the Scandinavian area. But the author has chosen carefully and well.

Teachers of history and of prehistoric archeology will find that Professor Jenks' chart is a valuable aid to themselves and to their students. Ten minutes' study of this chart will fix in the mind of the reader facts which ordinarily require for their absorption hours of concentration and much thumbing of leaves of text-books.

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PHILOSOPHY OR IRONY, WHICH?

IN the current number of *SCIENCE*, January 13, I read Dr. Stetson's short, but appreciative, review of

Professor Eddington's "Stars and Atoms" and noted what the reviewer says of the author's sense of humor. However, there is one sentence in particular in which the humor is so "dry" that the casual reader may be led to draw the erroneous conclusion that Professor Eddington endorses the views expressed in the first two paragraphs of Bertrand Russell's "What I Believe." These two paragraphs are sufficient to convince the reader that the author finds his *Ultima Thule* in the electron.

There is nothing in the context leading to the sentence referred to above—nothing but the absurdity of the conclusion itself—that would lead one to regard the sentence as ironical; but I take it, in reality, to be a "sly dig" at Russell and his school. After showing the possible complexities to be expected under conditions due to terrestrial temperatures compared with the simple structures found associated with the high stellar temperatures, Professor Eddington concludes, p. 84:

Our earth is one of those chilly places and here the strangest complications can arise. Perhaps strangest of all, some of these complications can meet together and speculate on the significance of the whole scheme.

My reason for regarding the above excerpt as ironical may be best expressed in Professor Eddington's own words as given in "Science, Religion and Reality," p. 214.

Is the motion of the editor's pencil to grammatically amend the split infinitive in this sentence simply the automatic response under physical laws of a complicated configuration of electrons to the external stimulus of this smear of ink on paper? Such an extravagant hypothesis might conceivably appeal to the crude materialist who supposes that the world of electrons is the fundamental reality.

Verbum sap.

M. M. GARVER

THE SOUTH AFRICAN STATION OF THE HARVARD OBSERVATORY

A NOTICE in *SCIENCE*, January 20, 1928, on the new South African station of the Harvard Observatory was taken indirectly from an unedited article in a student publication; it contains several mistakes and extravagant statements, three of which perhaps justify correction.

1. Mazel's Poort where the Harvard station is located is not a city; it is the water works station of the city of Bloemfontein. The new road and other assistance are being provided by Bloemfontein.

2. The Harvard Observatory is constructing one 60-inch telescope, not three, for the southern station.

3. Mr. W. F. H. Waterfield leaves Cambridge for

Bloemfontein in the near future to act as assistant to Dr. Paraskevopoulos, the superintendent of the southern station.

HARLOW SHAPLEY

APPARATUS

WHILE we are polishing up our pronunciation of scientific terms why not smother the "rat" so frequently heard in ap pa "rā" tus?

WILMER SOUDER

SCIENTIFIC BOOKS

Climate through the ages: A study of the climatic factors and their variations. By C. E. P. BROOKS. 439 pp., 39 figs. London: Ernest Benn.

THERE are two principal difficulties in the way of a satisfactory explanation of the great climatic changes of geologic time. In the first place, the problem is both meteorological and geological, and requires a command of both of these fields which is practically beyond the power of either the meteorologist or the geologist alone. Secondly, it necessarily rests upon a fragmentary and uncertain knowledge of past conditions, both of climate and physiography, which is often interpreted in very diverse ways by different students of the subject.

Both of these difficulties are illustrated in the latest excursion into the field by the distinguished British meteorologist, C. E. P. Brooks. Nevertheless, his book is one of the most valuable contributions to the problem that has yet appeared. Perhaps its most praiseworthy feature is its emphasis on the quantitative point of view, in contrast to the glittering generalities so prevalent in discussions of paleoclimatology. Even though this does in some cases result in an impression of mathematical exactness hardly warranted by the accuracy of the data involved, it certainly is a step in the right direction.

The book is divided into three parts, the first and longest being a discussion of "Climatic Factors and their Variation," the second dealing with geological climates and their causes, and the third with the climates of the historical past. Climates are broadly classified as "glacial" and "non-glacial," the distinction being based on the presence or absence of a polar ice-cap. It is clearly demonstrated that this factor is of paramount importance in determining the climate of a given period, and hence the classification into "glacial" and "non-glacial" climates is fully justified.

The discussion of the "critical temperature" which determines the expansion of a small winter-formed polar ice-cap into an ice sheet of continental dimensions is highly significant, and should be read by every student of climatic changes. It is shown that a very small fall of temperature—not more than

0.6° F.—may, under proper conditions, produce an ultimate lowering of winter temperature by about 45° F. The importance of this fact in the problem of Ice Ages is evident.

Wegener's hypothesis of continental drift is given considerable attention from a climatic point of view, the conclusion being that it is not necessary to explain even the low-latitude glaciation of Upper Carboniferous time, which Brooks accounts for by purely geographic factors. In spite of some very questionable assumptions, such as the figures for mean cloudiness and amount of solar radiation reflected from cloud surfaces, both of which are based on data applying to special cases, the argument is a strong one.

This dominance of geographic factors is the general theme of the book. While all climatic factors are recognized, and particular significance is given to volcanic dust and solar variations in special cases, the changing relations of land and sea, and the elevation of mountain ranges, with their resultant effects on winds and ocean currents, are shown as capable of bringing about even the major climatic fluctuations of geologic time. No resort to astronomic causes or to special hypotheses is necessary. In the case of historical changes of climate, which Brooks considers to be fully established, solar influences are given a prominent part.

The book is not without serious faults. It shows evidences of hasty and careless writing and insufficient proof-reading. The discussion on p. 75 is a hodge-podge of blunders, in which the direction of winds around a center of high pressure in the northern hemisphere and the direction of the Equatorial Current are both given incorrectly. The reason given on p. 182 for the vertical decrease of temperature gradient is also incorrect. No authority is quoted for the statements on pages 162 and 163 regarding the percentage of water in the Gulf Stream which reaches the Arctic Ocean and the melting of the ice floor in Spitzbergen about 3000 B. C. The figures on p. 166 and the diagram on p. 167 to which they refer are both wrong, leading to much confusion. Of p. 210 "windward" is used where "leeward" is meant. Other mistakes and omissions occur all too frequently.

Geologists will take exception to many statements in the book. Some of these, like that on p. 128, where the area of the Pleistocene ice-sheets is given as 1,000,000 sq. miles greater than the present area are inexcusable. It is far from true that "the accession of salt to the oceans is at present derived almost entirely from sedimentary rocks" (p. 93). Nor is there any adequate basis for asserting that deserts were extensively developed in southeastern United States during the Mesozoic (p. 273). The reference is presumably to the areas of Newark rocks, which