

PLANS for using an endowment given to Battle Creek College by Mrs. Mary F. Henderson, of Washington, as the basis for a nation-wide race betterment movement were announced by Dr. John H. Kellogg at the close of the Third Race Betterment Conference at Battle Creek, Mich. Mrs. Henderson has given to the institution an endowment of \$200,000 and a 4,000-acre farm in Missouri in the interest of race betterment. It is planned to make the college a race betterment institution.

THE grass herbarium of the U. S. National Museum has received from the Institut Botanique, Montpellier, France, through Professor J. Daveau, conservator, a valuable package containing duplicates or fragments of specimens of Paspalum. Among them are a good series of Salzmann's collections of Paspalum from Bahia, Brazil, some of Husnot's from Martinique and other early collections not before represented in the grass herbarium.

THE sum of £100 is being offered by the Royal Society for the Protection of Birds for an invention of a portable apparatus for the detection of small quantities of carbon monoxide in mines, to supersede the use of canaries and small wild birds now forming part of the equipment of rescue brigades. All competing essays should be received by March 31.

THE *Nation's Health*, which for a few years has been published in Chicago, has been transferred with its contracts, lists, good-will and other assets to the American Public Health Association to be published with the *American Journal of Public Health*.

UNIVERSITY AND EDUCATIONAL NOTES

THE Carnegie Corporation of New York appropriated \$2,000,000 and paid more than \$4,000,000 on previous grants for the fiscal year ended on September 30, 1927, in support of colleges, universities and other educational organizations, according to the report of its president, Dr. Frederick P. Keppel, which was recently made public. Of the appropriations \$831,500 went for educational studies. "Only \$84,000" was appropriated for libraries, chiefly for the maintenance of library schools. Other grants included \$97,600 for adult education, \$150,000 for the Carnegie Endowment for International Peace and \$500,000 in encouragement of the fine arts.

ON November 8 the city of Cincinnati, by a majority of 31,000, voted for \$1,425,000 for its municipal university, the University of Cincinnati. Out of these funds will be constructed an addition to the power

plant, library and recitation hall and a new building for the college of education.

DUKE UNIVERSITY has received from Mr. C. C. Dula, president of the Liggett and Myers Tobacco Company, \$200,000 to be added to the university's endowment fund.

AN engineering building, which will be erected at a cost of between \$250,000 and \$500,000, has been donated to Drexel Institute by Cyrus H. K. Curtis, of Philadelphia.

DR. F. A. WOLL has been promoted to be full professor and head of the department of hygiene in the College of the City of New York.

DR. R. F. RUTTAN, director of the department of chemistry at McGill University, and Dr. A. B. MacCallum, head of the department of biochemistry, have resigned. Dr. J. B. Collip, professor of biochemistry at the University of Alberta, has been appointed to succeed Dr. MacCallum.

M. VILLEMIN has been named professor of anatomy at the University of Bordeaux to succeed M. Picqué.

DISCUSSION AND CORRESPONDENCE ON THE MECHANISM OF ORIENTATION OF ATOMS IN MAGNETIC AND ELECTRIC FIELDS

WHEN atoms possessing magnetic or electric moments are subjected to a field they are supposed to take up definite quantized directions with respect to the field. Experimental confirmation of this view has been made for the magnetic case in the experiments of Gerlach and Stern, but the mechanism by which the orientation takes place presents serious difficulties which may be briefly summarized as follows. In the absence of collisions and radiation the field, of course, can produce only a precession of the atom about the direction of the field. The experiments of Gerlach and Stern, however, show that the atom comes to equilibrium with its moment in definite quantized directions relative to the field and it does this in a time which is less than 10^{-4} sec. Since no collisions are taking place in the beam the only possible method by which the atom can change its energy to become oriented is by the emission or absorption of radiation. But unless the probability of a transition from a non-quantum to a quantum state is very much greater than between two quantum states this process should take something like 10^{10} sec. according to a calculation by Einstein and Ehrenfest.¹

¹ Einstein and Ehrenfest, *Zeit. für Physik*, 11, 31, 1922.

This difficulty may be avoided if it be supposed that the oven chamber in which the atoms of the beam made their last collision is subjected to a stray field which is parallel to the deflecting field, for it has been shown by experiments with resonance radiation that a small field (of the order of a few gauss) is sufficient to cause complete orientation in the presence of collisions. Although this solution of the difficulty has been ruled out by Stoner on the supposition that the oven chamber was magnetically shielded yet in view of the fact that only small fields are sufficient to produce orientation and since if stray fields were present they would, from the geometry of the apparatus, have been parallel to the deflecting field, it seems that this cause of orientation should be given more weight.

A striking confirmation of the view that the atoms become oriented by stray fields in the oven chamber is provided by the recently published article by E. Wrede² on the deflection of beams of electric dipole molecules in a non-homogeneous electric field. In these experiments the oven, where collisions were taking place, was unquestionably field free and the traces produced by the deflected beam shows that the molecules had no definite quantized direction. We have here, then, a case where the field is unable to produce orientation in the absence of collisions.

A further test of the ability of the field to produce orientations might be made by a repetition of the Gerlach and Stern experiment, subjecting the oven chamber to definite magnetic fields. For example, if the oven field were at right angles to the deflecting field the orientations produced during collisions, in the case of atoms with a magnetic moment of but one magneton, would be in such directions that no deflection would be produced unless the deflecting field were able to change the orientation.

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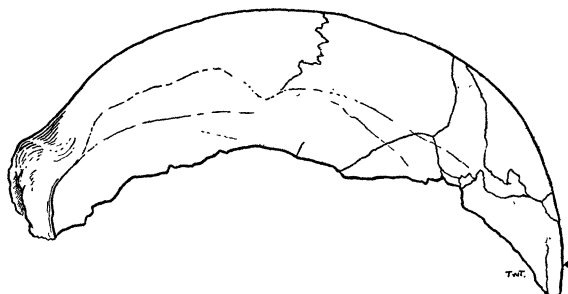
THE BARTOL RESEARCH FOUNDATION
OF THE FRANKLIN INSTITUTE

THE IDENTITY OF CLEAR CREEK SKULL

CONSIDERABLE discussion has occurred in regard to the identification of a calvarium found at Clear Creek near Everton, Arkansas, and purchased by Mrs. Bernie Babcock for the Museum of Natural History and Antiquities, Little Rock, Ark. As there has been unusual publicity concerning the age of this skull, it was necessary to obtain its accurate classification. The specimen was examined by Dr. T. Wingate Todd, professor of anatomy, Western Reserve University, and compared with the remarkable collection of

models of the important fossil skulls, together with numerous crania of *Homo sapiens* in the Hamann Museum.

The calvarium (Fig. 1) is obviously that of a

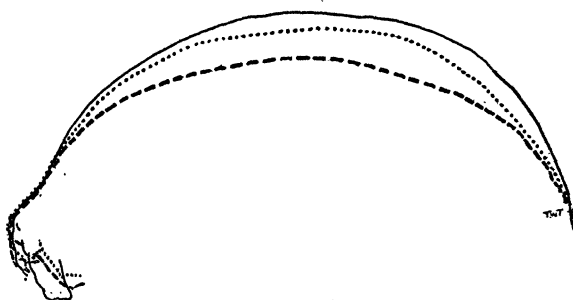


dolicocephalic individual because the cephalic index is approximately 65.4 mm. The large supraorbital ridges proclaim a male, and the union of all vault sutures¹ together with the texture, indicate a man about fifty years of age. The thicknesses of the vault are

Glabellar region.....	12.5 mm.
Vertical thickness at bregma.....	7.0 "
Region of lambda.....	6.5 "
Parietal eminence (approximately).....	5.5 "

Compared with corresponding dimensions on the modern male, white cranium, these thicknesses are but slightly greater than those of the average contemporary man.²

The supraorbital ridges possess the lozenge characteristics of contemporary dolicocephalic man, whether of white or American Indian stock. There is slight ridging of the sagittal vertex region and slight flattening of the parietal slopes as in primitive



—— CLEAR CREEK
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¹ Todd, T. W., and Lyon, D. W., Jr., "Endocranial suture closure; its progress and age relationship, Part 1," *Am. J. Phys. Anthrop.*, 7, 325-384, 1924; and Ectocranial closure in adult males of white stock, Part 2, *Am. J. Phys. Anthrop.*, 8, 23-45, 1925.
Anat. Record, 27, 245-256, 1924.

² Todd, T. W., "Thickness of the male white cranium."

² E. Wrede, *Zeits. für Physik*, 44, 261, 1927.