ANTHROPOLOGY

Primitive Skulls Declared Equivalent to Advanced Forms

"ALL MEN are created equal." Thomas Jefferson boldly pronounced this fundamental dogma of democracy as self-evident.

Since his time, apologists and rationalizers have been much occupied in shaving and chiseling off the edges and corners of this "hard saying," until we are left with a diluted doctrine based on oblique admissions of self-evident natural inequalities.

Comes now a world-known scientist, Dr. Eugene Dubois, discoverer and describer of *Pithecanthropus erectus,* Ape-Man of Java, most primitive known fossil human species (if indeed it is human), and bolder even than Jefferson declares a natural and physical parity between the two most widely different of living races. The proud white man of Europe and the poor, vanishing black of Australia, "lowest" of living human stocks, achieve closely equivalent ratings for their respective brain sizes when measured by a yardstick of his devising.

Not that Dr. Dubois claims absolute equality in cranial capacity. European white men average 1450 cubic centimeters skull content; white women 1300. Australian black males average slightly less than white women in cranial capacity; their women have a cranial content of a little under 1150 cubic centimeters.

These measurements, however, Dr. Dubois designates as only "apparent cephalizations." To obtain a figure representing a "real cephalization," it is necessary to take into consideration the body which the brain is called upon to manage. One must introduce into the formula factors representing bodily height and weight, and especially size and relative strength of the muscles.

The Netherlands anthropologist first obtains cranial justice for the white woman. After allowing appropriate weighings for the lesser female size, smaller and softer female muscles and other factors requiring compensation, he comes to the conclusion that "it appears to be proved with certainty, that the real cephalization of woman is equal to that of man."

Turning then to the humble black brother of the Australian bush, he gives him the benefit of the same allowances for less height, inferior physique and smaller muscular strength. Again the outcome is that "the real cephalization of the Australian aborigine is equal to that of the European."

But Dr. Dubois' doctrine of fundamental human equality, at least so far as head-body ratio is concerned, is even more sweeping. Calling attention to the establishment of similar parities in real cephalization among white men, Japanese, Eskimos and the extinct Neandertal race, he concludes: "It again bears evidence thereof that man did not gradually progress in human organization, but came into existence as one finished genus, and that indeed all the multiform types of man, in the present and in the past, belong to one and the same stage of natural animal organization."

Science News Letter, August 24, 1935

ELECTRICITY

World's Tiniest Motor Built by Russian Youth

AN ELECTRICAL motor built in ten days by a 21-year-old Moscow student is now the smallest machine of its kind in the world. Dwarfing other tiny motors, it is about the size of a large fly. It weighs only .37 gram.

Constructed by Yuri Yuremin, a student at the Moscow Institute of Non-Ferrous Metals, it consists of 31 parts. A four-volt pocket-flashlight battery can operate it, and it can also run on regular city current reduced in voltage by a transformer.

The current-carrying parts are of brass, and all insulating parts are ebonite. Aluminum rivets fasten it to a celluloid base. The armature measures about .16 inch across, and has 380 windings of wire not quite .002 inch in diameter.

Science News Letter, August 24, 1935

ASTROPHYSICS-METEOROLOGY

Cycle of 23 Years Dominates Heat and Light of Sun

RADIATION of heat and light from the sun fluctuates in twelve distinct cycles, but among them the dominant one is a 23-year period. A great variety of events on earth follow this 23-year cycle, ranging from the floods of the Nile to the abundance of codfish.

An analytical study of the sun's cycle activities, carried on for many years by Dr. C. G. Abbot, secretary of the Smithsonian Institution, has been brought to completion and has been published in a special bulletin of the Institution.

The superposition of cycles in solar radiation presented great difficulties in their analysis and study, for sometimes they coincide, giving great stress to their effects, and sometimes they run against each other, resulting in mutual cancellation. However, continual refinement of instruments and growing skill in observation, combined with new methods of statistical handling of the results, have enabled Dr. Abbot to unsnarl what at the beginning looked like a hopeless tangle of data.

Dr. Abbot is proceeding with great scientific caution in the application of his results to the problem of long-range

TWO FLY-POWER MOTOR

forecasting of weather changes and tendencies. He made a forecast of the general climatic conditions for 1934 which proved to be substantially correct, but he refrained from publishing it in advance, being much more concerned with checking up on his method and its results than in its immediate use. Similarly, he has made forecasts for 1935 and 1936—and locked them up in a vault. He will not take them out until the returns are all in for their respective years. Then he will submit himself to an impartial scoring.

His results on the 1934 forecasts, which were drawn for 66 different places, range in his own estimation from "excellent," when the course of events followed the prediction very closely, to "bad," when events and predictions did not fit at all. The score runs: excellent, 27 per cent.; good, 42 per cent.; indifferent, 17 per cent.; bad, 14 per cent.

Science News Letter, August 24, 1935

MEDICINE

New Cancer-Causing Chemicals Are Unique in Structure

Capable of Causing Highly Malignant Tumors, But Action Is Slower Than That of Other Compounds

ANOTHER advance in the search of physicians to discover the cause of cancer has just been revealed at Cambridge, Mass., in the report of Prof. Avery A. Morton and Dr. Daniel B. Clapp of Massachusetts Institute of Technology and Dr. Charles F. Branch of Evans Memorial Hospital, Boston, that they have discovered two new chemicals which will produce the disease in mice.

The two new cancer-causing chemicals are known as triphenylbenzene and tetraphenylmethane. In their preliminary account (*Science*, Aug. 10), the Cambridge scientists state, "In a year's time 12 out of 60 mice had well-developed tumors of a highly malignant type. In the case of tetraphenylmethane 25 mice were painted twice weekly with a 0.5 per cent. solution in benzene. After the same period well-developed epitheliomata were present in eight cases. It is interesting to note that the percentage of positive results is relatively high in spite of the long time necessary to induce the growth."

The carcinogenic action of the two new hydrocarbon compounds is considerably slower than previously reported chemicals which have a similar action. And they differ markedly in chemical structure.

The cancer-causing chemicals known up to now have, in general, consisted of numerous rings made up of carbon atoms. Four or five of these carbon rings were believed in some cases to be linked in a single molecule. Accompanying these condensed ring structures was also a characteristic atom arrangement which chemists call the phenanthrene nucleus.

On studying such widely differing materials as the bile acids and the sex hormones chemists previously had also noted an arrangement of atoms similar to those found in the cancer-causing chemicals.

Proof was not certain, but the suspicion arose that perhaps in the human body cancer-causing substances might be created.

What interests medical scientists in the two new compounds is that neither of them can be derived from the bile or the sex hormones. There is also a complete absence of the condensed ring systems and a lack, too, of the phenanthrene nucleus.

"In an effort," the scientists explain, "to find a common ground on which these widely different classes of carcinogenically active agents can stand we may make the tentative assumption that in the hydrocarbons so far discovered the property of producing cancer resides in the benzene nucleus as modified or affected by substituents attached in either the condensed or open manner. Work is now in progress to limit more exactly the nature and position of the substituents."

Describing the structure of the newfound cancer-producing chemicals, Drs. Morton, Clapp and Branch report:

"In triphenylbenzene a single ring holds three other benzene rings attached in the 1, 3, 5 positions, but in tetraphenylmethane no benzene ring is attached to another. The linkages in this last instance are through a central carbon atom."

Science News Letter, August 24, 1935

India was famous for its steel in the days of Alexander the Great.

MEDICINE

New Discovery Widens Field Of Necessary Research

By PROF. AVERY A. MORTON
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PURE organic compounds which will produce cancer have lately been the subject of considerable interest. One series of these substances, discovered in England, consists of compounds made up of benzene nuclei, each condensed to the other at two or more points. The framework which results bears some outward relationship to that of the sterols, bile acids, and hormones. It was therefore supposed that cancer might originate from deranged metabolism of some product occurring naturally in the animal body.

The recent work of Morton, Branch, and Clapp shows that the production of cancer by pure hydrocarbons is much more general than supposed. Two substances, triphenylbenzene and tetraphenylmethane (known only in the organic laboratory), consist of benzene nuclei in which each portion is attached to the rest of the molecule at only one point. Both are cancer-producing, although their structure is absolutely different from that of other known agents.

The discovery widens the field of cancer research and requires the examination of a large number of organic compounds to see if they possess the power to produce tumorous growths. By removing the specific character of the organic causative agent a broader basis will be needed in explaining the action of these compounds.

Science News Letter, August 24, 1935

PUBLIC HEALTH

Scattering X-Rays Tell of Dust Danger

X-RAYS, scattering upon striking atmospheric dust, warn of the deadly particles of free silica that make certain industrial jobs extra-hazardous.

How this new task has been added to the long list of beneficent works performed by the invisible penetrating rays, was related by Prof. G. L. Clark and D. H. Reynolds of the University of Illinois, before the meeting of the American Chemical Society at San Francisco.

Other dusts make the air thick and produce discomfort, but the real peril to workmen comes from free or uncombined silica. Methods hitherto in use by public health investigators have been diffi-