erection of the Alps, Andes and Himalayas in Tertiary times was trivial in its influence for man's advent and his successful occupation of the earth in comparison with the gentle but insidious growth of "mere unconquerable grass" and its green carpet of "wise turf" which in some form clothes by far the greater part of the land of the globe.

The kind of developmental reaction of which this is but a single example must clearly have had influence on bodily features other than bones and horns, teeth and claws, speed and strength; and one of the most striking has been on intellectual development and the size and shape of brain.

We do not, and perhaps can never, know the quality of the material of which the brains of fossil creatures were made, for we have no instrument to pierce the veil of time as the spectroscope has penetrated the abysm of space. But we are even now learning something about their shapes and convolutions, and more about their mass in its relation to the size of the bodies controlled; from the time of the earliest Ordovician fishes, through the history of the amphibia, reptiles, birds and mammals, up to man himself.

The brain of those gigantic if somewhat grotesque reptiles, the dinosaurs, the tyrants of Mesozoic time, is relatively tiny. In Diplodocus, 80 feet in length and 20 tons in weight, the brain was about the size of a large hen's egg. It is true that there was a big supplementary sacral ganglion which may have taken chief charge of locomotion and helped to secure coordination throughout the hinder part of its huge length and bulk; but of true brain there was not more than a quarter of an ounce to control each ton of body and limb; and we begin to understand why they lost the lordship of creation.

The proportion of brain to body improved in those reptiles which took to flying, possibly in relation to their acquisition of warm blood, and in the birds evolved from reptiles; but it is only in mammals that a marked advance is seen. Here the brain of Uintatherium, a great rhinoceros-like animal of Eocene date, weighing 2 tons, was about the size of that of a dog. This proportion of half a pound of brain to each ton of body shows how far the mammals had gone and still had to go.

A 12-stone man of the present day has about 3½ pounds of brain—an amount not far short of half a hundredweight per ton.

Even though we can know nothing of its material, this steadfast growth in the guiding principle, through the millions of centuries that have gone to its development, is surely one of the most remarkable conclusions that we owe to geology. Of all the wonders of the universe of which we have present knowledge, from the electron to the atom, from the virus and bacillus to the oak and the elephant, from the tiniest meteor to the most magnificent nebula, surely there is nothing to surpass the brain of man. An instrument capable of controlling every thought and action of the human body, the most intricate and efficient piece of mechanism ever devised; of piercing the secrets and defining the laws of nature; of recording and recalling every adventure of the individual from his cradle to his grave; of inspiring or of ruling great masses of mankind; of producing all the gems of speech and song, of poetry and art, that adorn the world, all the thoughts of philosophy and all the triumphs of imagination and insight—it is indeed the greatest marvel of all.

And when we contemplate the time and energy, the sacrifice and devotion, that this evolution has cost, we must feel that we are still far from the end of this mighty purpose, that we can confidently look forward to the further advance which alone could justify the design and skill lavished on this great task throughout the golden ages that have gone.

# SCIENTIFIC EVENTS

## REPORT OF THE BRITISH FORESTRY COMMISSIONERS

A GENERAL review of the first fifteen years' work of the British forestry commissioners and also of the quinquennium, 1929–34, is given in the annual report for the year ended September 30, 1934. As summarized in the London *Times*, it notes that increasing attention has been given to the utilization of home-grown timber. At present the amount of home-grown timber cut in the forests is not large compared with the total felled in the country. Sales of forest produce have averaged £54,680 a year over the last five years, whereas the total value of home-grown timber felled for sale or estate use was estimated in 1930 to amount to £1,545,340. At the same time it is expected that the proportion of state-owned timber sold must gradually increase.

The total area of plantations was 316,000 acres, including 250,000 acres planted or replanted and 66,000 acres acquired and transferred under the Transfer of Woods Act, 1923. There are also 228,000 acres awaiting planting. The ultimate forest area is consequently 544,000 acres, which compares with 367,000 acres five years previously.

The total number of forest units was 186, an increase of 35 in five years. The rate of increase has slowed up owing partly to the reduction in acquisitions and partly to the fact that with a larger total number

of units it is often impossible to add new acquisitions to existing units. In 1934 the average unit contained 2,900 acres of plantable land compared with 2,400 acres in 1929. Of the 186 units 74 are in England, 27 in Wales and Monmouth and 85 in Scotland.

Developments in forest technique are recorded, and, with regard to education, it is stated that the average attendance of forestry students at the Universities of Oxford, Cambridge, Bangor, Edinburgh and Aberdeen was approximately 160 a year and in the 15-year period some 524 degrees and 222 diplomas were awarded. The Imperial Forestry Institute, established at Oxford in 1924 for post-graduate instruction, has been attended during the 10 years by 274 students.

Interest in the countryside and the preservation of its distinctive character and amenities has increased greatly, according to the *Times*, in the last few years, and the report shows that, in the course of managing the New Forest, it has become apparent that still wider recreational use might be made of unplantable land. This area more nearly conforms to the general conception of a national park than any other in Great Britain. There are no means of estimating the number of people who visit or use the New Forest in the course of the year, but there must be many tens of thousands. For campers alone some 800 to 900 permits are issued annually. Of all the numerous ancient Royal forests only two—Dean Forest and New Forest—have survived, haphazard, in a form which affords opportunity for both timber production and public recreation. It appears to the commissioners that by taking a little thought and possibly incurring a little additional expenditure in the utilization of the land acquired for the new forests, it may be possible to provide, for the future, areas as highly prized by the public as is the New Forest to-day.

The commissioners have recently been in communication with the Council for the Preservation of Rural England on the subject of the relation of forestry and afforestation to the amenities of the countryside and a joint informal committee has been formed for the discussion of outstanding questions.

## PETROLEUM LABORATORIES OF THE BUREAU OF MINES

*Industrial and Engineering Chemistry* states that plans for future activities of the research laboratory at the Amarillo, Texas, Helium Plant have been announced by Dr. John W. Finch, director of the U. S. Bureau of Mines. The laboratory staff, which in the past has been concerned largely with work relating to production and conservation of helium, will direct its efforts toward studies of technical problems involved in production and utilization of petroleum and natural gas. The Amarillo laboratory is one of the best equipped in the country for research on properties of gases at low temperatures.

The laboratory at Amarillo will make studies of physical and thermal properties of petroleum mixtures that have influence on their flow through the producing sands and in wells, using specialized experience and technique developed in the research that has done so much to improve methods and reduce costs of extracting helium from natural gas. Also the activities of the research group at Amarillo will include special studies of the causes and prevention of freezing in high-pressure, natural gas pipe lines, often experienced at temperatures many degrees above the normal freezing point of water. This work will be closely correlated with investigations of flow of natural gas through pipe lines, which have been under way at the bureau's experiment station at Bartlesville, Okla.

The petroleum research activities at Amarillo, as well as the continued operation of the government-owned helium plant and 50,000 acres of natural gas properties, will be under the general direction of R. A. Cattell, chief engineer of the Petroleum and Natural Gas Division, with headquarters in Washington, D. C. C. W. Seibel, supervising engineer of the helium plant, will be in administrative charge at Amarillo, and several petroleum technicians will be added to his staff to aid in the petroleum research centered there.

The petroleum field office of the bureau at Laramie, Wyo., is being reopened as a result of a provision in the appropriation for the fiscal year ending June 30, 1936, for establishing and operating a petroleum experiment station on the campus of the University of Wyoming. Offices and laboratories are now in temporary quarters but will be moved to a new building to be erected by the university. The office was closed on June 30, 1933, because of reduction in funds available for oil and gas investigations. The staff will begin work with a general survey of the Rocky Mountain oil fields and refineries.

## MOTION PICTURE FILMS OF THE NATIONAL ARCHIVES OF THE UNITED STATES

A CORRESPONDENT of *The New York Times* calls attention to a measure establishing a national archives of the United States, which has recently been enacted. This section reads:

> The National Archives also may accept, store, and preserve motion picture films and sound recordings pertaining to and illustrative of historical activities of the United States, and in connection therewith maintain a projecting room for showing such films and reproducing such sound recordings for historical purposes and study.

The "projecting room" is a small theater, equipped with the latest and finest in motion picture equip-