'frontal' zone enriched in silica and the 'rear' zone enriched in olivine. Applying this process to the primitive Earth one would postulate a degasification of the original material and formation of the atmosphere, hydrosphere and lithosphere through geochemical migration of elements.

Methods of study are discussed by V. N. Florovskaya and L. I. Ovchinnikova (11, 69; 1963), who describe the study of coals, bitumens and fossil plants by means of the 'luminescent microscope', using ultra-violet light. Ya. L. Blikh and V. M. Bondarenko (9, 85; 1964) describe a 'deep-seated' geological survey method, measuring the intensity of cosmic rays in boreholes and mines.

Among accounts of new discoveries is the article by V. P. Solonenko (9, 102; 1964), who describes a newly discovered volcanic region in Eastern Siberia, in which 15 volcanoes of Quaternary age have been mapped and numerous traces of earthquakes recorded. This region is centred on the Udokan ridge situated between the rivers Vitim and Olekma, both tributaries of the River Lena. Siberian mosses of the Permian era, first discovered by M. F. Neiburg in 1941, are described by S. V. Meien (5, 73; 1963).

TWENTY-FIVE YEARS OF CRUDE OIL PRODUCTION IN GREAT BRITAIN

IN 1939 production of crude petroleum from English oilfields amounted to 3,145 tons; in 1963 the total was 122,764 tons. After a quarter of a century it is interesting to take stock of the enterprise and expertise which have made possible this progress, humble though it may seem when measured by overseas standards. This has recently been done by R. G. W. Brunstrom of the Exploration Department, British Petroleum Co., Ltd., London, in an article entitled "BP's First Quarter Century of Crude Oil Production in Britain" (*BP Magazine*, No. 13, 1964; London). Actually, the first oilfield discovered in Britain was at Hardstoft, Derbyshire, in 1919, drilled for the then Ministry of Munitions, which ceased further explorations for oil in 1922. For various reasons private companies did not pursue the quest until some years later; it was, in fact, the Petroleum (Production) Act, 1934, which created the fillip to industrial enterprise in oil finding. This act vested in the Crown the ownership of all mineral oil not discovered to that date; it supplied just the attractive operating conditions under which oil companies felt justified in spending energy, time and particularly large sums of money in the search for oil in Britain. British Petroleum pioneered this new phase by drilling wells in the southern counties between 1936 and 1938, for example at Portsdown, near Portsmouth, and in Dorset, but with no success. But in the latter year natural gas was struck at Cousland, Midlothian; early in 1939 it was found at Eskdale, Yorkshire. A freak find was that of a shallow field at Formby, near Southport, Lancashire, in May 1939, which has produced more than 9,800 tons of crude oil since then, but with no geological encouragement of commercial extension. Soon after Formby came the well-known discovery of oil at Eakring, Nottinghamshire, a significant turning point in this history. "Eakring, apart from being a significant oilfield in its own right, was immediately seen to be the first of a group of similar fields awaiting discovery. Formby brought hope of further success, but Eakring brought certainty." Eakring owed much to geological acumen at the time; coal mine and borehole evidence, confirmed by seismic refraction surveys, helped to establish it and, by continuation particularly of the geophysical technique, other discoveries in that region were made—Kelham Hills, 1941, Dukes Wood, 1941, Caunton, 1943. A small field discovered at Nocton, south of Lincoln, in 1943 yielded 40 tons of oil, then went to water. Although numerous exploration wells were drilled during the ensuing 10 years, they were not successful until a field was discovered at Plungar, Leicestershire, in 1953. A technique known as 'secondary recovery', that is, injection of water through wells drilled around the periphery of an oilfield, driving oil towards the production wells by a water flood, had been successfully employed to arrest decline in production in the Eakring group, and by 1953 had become standard practice in most British fields. The discovery of Egmanton oilfield in 1955 started another bout of exploration activity which has continued to the present time. "An average of one new oilfield has been found in the East Midlands in each of the last seven years, and three new gas fields have been found but are not yet in production. The new fields are of varying sizes, and the largest, Gainsborough, is probably as big as Egmanton." One particularly gratifying success is recorded from Kimmeridge, Dorset, where a 943-ft. well was drilled in 1937 and abandoned as a dry hole; a well drilled to 1,791 ft. near the same site in 1959 found oil and thus the Kimmeridge oilfield came into being. It is noteworthy that: "Up to the present there have been only three non-BP oil wells in Britain—one at Hardstoft and two at the small Esso field named Midlothian, near Dalkeith, Scotland".

ARID ZONE FORESTRY

THE subject of afforestation and reforestation in arid zones is dealt with comprehensively in a publication entitled *Tree Planting Practices for Arid Zones**, which has recently been revised by Dr. A. Y. Goor for the Food and Agriculture Organization of the United Nations.

About one-third of the world's land surface lies in the arid and semi-arid zones where the annual rainfall is less than 24 in. The arid zone, with less than 12 in. of rainfall a year, includes some of the great deserts of the world, but it is in parts of the semi-arid zone that afforestation and reforestation schemes have been and are being tried. These schemes and others aimed at improving the natural tree growth can make a useful contribution to the general welfare of the peoples by bringing to localized areas a lessening of wind erosion, a reduction of evaporation from the soil and of plant transpiration, and in fixing moving sand, arresting gully and sheet erosion, in providing æsthetic benefits and in supplying timber and other products. But where the forester is called on to try to bring about these improvements through trees, he is usually faced with a set of climatic and edaphic factors which does not make his task an easy one. Very often he has to deal with soils that have been degraded by over-grazing, fire or over-cutting. He is often very restricted in the choice of species for planting and has to rely on a limited number of drought-resistant ones. The forester working in these conditions will find this handbook very useful, for it includes methods of seed collection and its handling, nursery and planting techniques. Perhaps some

* Food and Agriculture Organization of the United Nations. FAO Forestry Development Paper No. 16: *Tree Planting Practices for Arid Zones*. Pp. xii+233+2 maps. (Rome: Food and Agriculture Organization of the United Nations; London: H.M.S.O., 1963.) 15*s*.; 3 dollars.

reference might have been made to the use of *Opuntia* or some other live hedging for nurseries.

The last two chapters on plantations are interesting, and irrigation is dealt with in some detail. Afforestation in such conditions is usually thought of as being uneconomical and written off as necessary protective measures on difficult sites. However, there is a body of opinion which considers that trees have sometimes been planted for protection of a watershed when, in the particular circumstances, a well-managed pasture would have provided just as much protection and possibly, in an arid zone, allowed more water to filter down to the valleys below. Indeed, it has now been demonstrated in some arid regions that forest trees established on better soils than has been usual to allocate to this type of work in the past are providing favourable returns on the investment. In fact, forestry has proved itself to be the most economic of the various land uses possible. But why should these plantations be given the special name of "forest tree orchards"?

There are two appendixes on tree species used in arid zone afforestation and on seed collection, extraction, storage and pre-treatment practices, also listed by species. The two maps show the distribution of arid homoclimates for the eastern and western hemispheres. The list of selected references is adequate, but the more recent *Exotic Forest Trees of the British Commonwealth* (Streets, Oxford University Press, 1962) should have replaced Troup's publication with a similar title. C. J. TAYLOR

NEW FOSSIL APES FROM EGYPT AND THE INITIAL DIFFERENTIATION OF HOMINOIDEA

By PROF. E. L. SIMONS

Department of Geology, and Peabody Museum, Yale University, New Haven, Conn.

THE third Yale Paleontological expedition to Egypt (November 1963–March 1964) supported by a U.S. National Science Foundation grant in geology (*P*–433) concentrated fossil-collecting efforts on a locality (*I*) in the upper levels of the Qatrani Formation, Oligocene of Egypt, which had yielded a few surface finds of early Anthropoidea in the previous season (January 1963). Extensive excavation at this quarry last winter, primarily during December and January, produced a considerable series of continental vertebrates, particularly rich in primates. Eleven mandibles and more than thirty isolated teeth of primitive Anthropoidea were recovered in addition to two jaws found in the previous season.

These finds add considerably to our understanding of the origins of Old World Higher Primates including, potentially, the ancestors of man at that period. Among these new primate materials are several interesting juvenile specimens of *Apidium phiomense* Osborn[1]; another represents a new large species of *Parapithecus*. The primary purpose of this article, however, is to describe briefly two wholly new and somewhat unexpected genera and species of Primates which were recovered in the collections from Quarry *I*. These and some 90–100 other Fayum primate specimens from lower horizons are to be illustrated and discussed by me in a forthcoming monograph on early Cainozoic mammalian microfaunas of the Fayum. However, in view of widespread interest in higher primate origins it seems advisable to record taxonomically at the present time the two most significant new species.

Geological Horizon

The locality which yielded the new primates described here is appreciably higher stratigraphically than the classic fossil-vertebrate localities of the Fayum region, and is approximately that of the "upper level" of Osborn[1,2]. From this upper fossil wood zone came specimens which Osborn described as the types of a rodent *Metaphiomys beadnelli*, a primate *Apidium phiomense*, and a creodont carnivore *Metasinopa fraasi*. Evolutionary advances in the fauna at Quarry *I*, compared to those of the lower levels, suggest that considerable time elapsed between accumulation of these faunas, but at present it is not possible to say more than that most species appear to be different from those of the lower zones. For example, examination of Fayum rodents by A. E. Wood, soon to be published, have shown that a common rodent of this upper level, *Metaphiomys beadnelli*, is not present at the next lowermost Quarry (*G*) in the section, but that a smaller, more primitive species of *Metaphiomys* that could be ancestral to *M. beadnelli* occurs in Quarry *G*. Similarly at Quarry *G* a small species of *Apidium*, *A. moustafai*, is abundant. *A. moustafai* is almost certainly ancestral to the much larger *A. phiomense* of the Quarry *I* level. Apparently the type specimen of the archaic hominoid primate *Propliopithecus haeckeli* Schlosser[3] came from about the level of Quarry *G*, or even lower in the section, for a left $M_{\bar{1}}$, indistinguishable from that of *P. haeckeli*, has been recovered from Quarry *G*. Other teeth of *Propliopithecus* sp. from Quarry *G* are appreciably larger and somewhat different in morphology from those of the type species, *P. haeckeli*. At the Quarry *I* level no teeth of *Propliopithecus haeckeli* have been found, but instead only those of a generally larger and more advanced primate species. Taken together these evolutionary differences between the faunas of the two upper quarries, *G* and *I*, their stratigraphical separation by more than 250 ft. of varying, partly cyclothemic sediments, including riverine sands, marine limestones and marls, indicate that the fauna of Quarry *I* represents the latest known Oligocene fauna of Africa and one which is distinctly different from the classic Fayum faunas examined by Andrews[4] and Schlosser[3].

Systematics

Order, PRIMATES
Superfamily, HOMINOIDEA
Family, Pongidae
Genus *Aegyptopithecus*[5], gen. nov.

Type: Aegyptopithecus zeuxis[6], new species.

Generic characters: Lower dental formula 2?.1.2.3, size approximately that of a gibbon and 25 per cent larger than the type of *Propliopithecus* in most comparable measurements. Differs from its contemporary *Propliopithecus* in showing relatively larger canine, premolar heteromorphy and relatively larger $M_{\bar{2}}$ and $M_{\bar{3}}$. Resembles *Proconsul* in marked molar size increase posteriorly, $M_{\bar{1}} < M_{\bar{2}} < M_{\bar{3}}$, but differs from members of the latter genus, *Pliopithecus* and *Dryopithecus*, in possessing a more triangular $M_{\bar{3}}$, narrowing posteriorly; unlike most *Proconsul*, entoconid and hypoconulid (rather than hypoconid and hypoconulid) joined by distinct crest. Resembles *Dryopithecus* in rounded outline of $M_{\bar{1}-\bar{2}}$ but unlike later dryopithecines retains lower and more rounded molar cusps, as in *Propliopithecus*. Ascending ramus of mandible approximately 40 per cent broader from front to back compared with depth of horizontal