in others it appears to foreshadow the prominent nose of the modern European.

The evidence of the nose of Palæolithic man leaves the question of pigmentation of the early European open. The distribution of pigmentation among modern races could be explained best by supposing that the appearance of the fairer races—the Caucasian and Mongolian—was one of the more recent events of human evolution, and that the site of their evolution was in the central populations of the more northern parts of the Old World. The frizzled hair of the negro was a highly specialised feature. Their thick everted lips, unlike the thin anthropoid lips, at first sight seem also to be so, but when the arrangement of the labial musculature is examined, it is seen that the negro's lips are more anthropoid than the European's; but the European form, notwithstanding their apparent thinness, appears to be a modification of the negro form. The high and prominent cheek-bones of the negro are due, not to an absolute greater breadth of the face, but to the fact that the muscles of mastication have become specialised in different directions in the negro and European; in the negro the masseter muscle, which arises from the cheek-bone, is particularly large, whereas in the European it is the temporal muscle, which has its fixed basis on the side of the skull, that retains the greatest relative development.

The apparent breadth of the negro's face is largely owing to the fact that the basal part of the skull, to which the neck muscles are attached, is small. The small attachment of neck is a feature of the young of all Primates, and also one in which the negro has assumed a less anthropoid form than the European. The prognathism of the negro is due to several factors; it is chiefly due, not so much to a larger, but to a healthier dental development, which ensures a due forward revolution of the jaws during the eruption of the permanent teeth, thus providing an ample air-way in the pharynx. In Europeans the revolution forwards of the jaws showed a distinct tendency to become arrested prematurely, thus contracting the pharynx. The negro condition was the more Simian, but it is also one which modern Europeans would willingly share with him, because of its functional merits. Sir William Flower's method of estimating prognathism gave misleading results. The most accurate method of stating the development of the jaws was to give the area of the palate and the total size of the teeth.

Some of the most characteristic features of the negro race were to be seen in their foreheads. While Palæolithic Europeans showed the Simian beetling brows and receding forehead, features still shown in some degree by modern white races, the great majority of African negroes were characterised by prominent foreheads and a complete absence of that condition which might be described as supra-orbitalism. It is true that some tribes on the west coast, the oceanic negroes, and the Tasmanians still retain this primitive character. Indeed, the outstanding feature of the negro's skull is a tendency to retain characters of the immature skull of other races. Those who know the psychology of the negro best ascribe to his brain the boyish nature here ascribed to his skull.

The pygmies, usually described as Negritos, are true negroes in which the tendency to assume immature characters has become hereditary to an extreme degree. They are widely distributed. Sir Harry H. Johnston has shown how they are scattered amongst the forest tribes from the west coast almost to the east coast of Equatorial Africa; they stretch southwards almost to the Cape, and isolated communities are found as far eastwards as the Philippines and New Guinea. Two explanations may be offered for their distribution:—(1) they are remnants of a race that was spread formerly throughout the southern half of the Old World; (2) they are modifications produced locally from the larger negro. The second explanation is apparently the correct one, for the Congo pygmies share all the physical features of the Bantu except size; the Bushman has the characters of the Hottentot, while the pygmies of the far east find their nearest representatives in the negroes of the Oceania. Recent advances in our knowledge of human pathology make this supposition of the origin of pygmies more probable. Disturbances in the secretion of certain glands, such as the pituitary and thyroid, lead to the production of the characters of Palæolithic features in some individuals and true dwarfism in others. In the Miocene period the large-bodied Primates had already appeared; primitive men were certainly not pygmies in size.

An analysis of the cranial features of the aborigines of Tasmania and of Australia shows that we have in these two races an early stage in the differentiation of the negro and negroid races of mankind. The Tasmanian is the most primitive type of *negro* yet discovered; the Australian, on the other hand, although deeply pigmented and less Simian in some features than the Palæolithic European, is the most primitive representative of the *negroid* race. Negroid as he is, the native Australian represents a stage in the evolution of the dominant non-negroids of the northern hemisphere. It is a remarkable fact that the negro and negroid races occur side by side, not only in Austral-Asia, but in Asia proper and in Africa. The negro Semangs of the Malay Peninsula live with the negroid Sakai as neighbours; the Veddahs of Ceylon are not far from the negro of the Andamans; even in Quaternary Europe the negro race discovered by Dr. Verneau in the caves of Grimaldi were early successors, if not contemporaries, of Palæolithic man. The Grimaldi negroes find their nearest modern representatives in the Oceanic, not the African, negro; equatorial Africa and northern Europe were the probable centre in which the black and white races had reached their present degree of structural evolution. The two centres were linked together, and always had been linked, by racial zones which showed intermediate characters. Modern anthropologists are inclined to ascribe the characters of intermediate races to intermarriage. Interbreeding had certainly played a part, but probably a small one. The truer explanation seems rather to lie in regarding intermediate races as representing intermediate stages of physical and mental evolution.

TREES AND FORESTS.

THE botanical gardens at Peradeniya, Ceylon, are celebrated for their vegetation splendour, so that a list of beautiful flowering trees recommended by the curator, Mr. H. F. Macmillan, will appeal to many outside the range of those for whom the Circular (vol. iv., No. 20) of the gardens is immediately intended. In the author's opinion, the leguminous tree *Amherstia nobilis* is not to be excelled, although *Lagerstroemia flos-reginae* passes under the name of "pride of India," and *Poinciana regia* is the famous "flame-tree." The Amherstia was introduced to Ceylon from Burma, and it is remarkable how many of the plants mentioned have been imported from the tropics of the New and Old World. *Gliricidia maculata* is a recent introduction from the West Indies; *Solanum macranthum*, the "potato-tree" from Brazil, is noteworthy as the only species of the order that grows to the size of a tree.

A description of the indigenous trees of southern Rhodesia, together with their vernacular names and products, is provided by Mr. C. F. H. Monro in the Proceedings of the Rhodesia Scientific Association (vol. viii., part ii.). An important matter is the production of timber suitable for mining, construction, and agricultural purposes. The most useful timbers are yielded by *Copaifera mopani*, *Pterocarpus angolensis*, *Photinia mahobohobo*, and *Parinarium mobola*. *Baikiaea plurijuga* is known as Rhodesian teak; *Afzelia cuanensis* supplies the local mahogany, while a somewhat similar, handsome wood is furnished by *Faurea saligna*, a species of Proteaceæ. The woods of some of these, as also of *Callitris Whytei* and *Terminalia sericea*, are said to be ant- and borer-proof.

Two forest pamphlets (Nos. 12 and 14) recently issued by the Government of India relate to *Berrya Ammonilla*, a tree, belonging to the family Tiliaceæ, that is found principally in Burma, and *Pterocarpus macrocarpus*, a leguminous tree yielding Burma padauk timber. Regarding the former, logs up to 20 feet in length, and measuring 4½ feet in girth, can ordinarily be obtained. The timber is tough, elastic, and straight-grained; it

works and finishes well, so that it would appear to be suitable for export; but the annual outturn is only computed at 1500 tons, and there is a good local demand for construction work, for carriage shafts, draught poles and various agricultural implements. Burma padauk must be distinguished from Andaman padauk, obtained from *Pterocarpus dalbergioides*, which is noted for the brilliant red colour of select logs. Although inferior in colour, Burma padauk is much superior in strength and durability, and is regularly supplied to the Ordnance Department for spokes and felloes of wheels, poles, yokes, and other purposes. Timber which does not comply with the stringent requirements of the Ordnance Department is quite suitable for wheel work, furniture, and interior decorations. Both kinds of padauk have been imported to England and America, but various causes have militated against their successful exploitation in this country.

A forest pamphlet (No. 16) issued by the Government of India is devoted to an account of experiments conducted by Mr. R. S. Hole with the view of determining the best season for coppice fellings of teak. The rainy season—mid-August to October—is frequently selected for felling, although it might be expected that, vegetative activity being then at its height, the development of coppice shoots would be poor. However, the trials carried out, with many precautions, indicate that the worst period for the fellings is from the time, April to August, when vegetative activity commences, up to and for a short time after the full development of the foliage, and that reproduction is most vigorous in the months of March and September. Incidentally, the author notes that good fertile seed has been obtained from nine-year-old coppice shoots of teak.

It is a coincidence that information regarding the importance of trees belonging to the Dipterocarpaceæ should be forthcoming simultaneously from Burma and the Philippines. In the *Philippine Journal of Science* (Botany, vol. iv., part vi.) Mr. H. N. Whitford presents some striking estimates regarding the preponderance of the family in the Philippine forests, according to which Dipterocarp trees may be expected to yield three-quarters of the total volume of merchantable timber growing in a virgin forest area computed at 30,000 square miles. He directs special attention to the value of the woods known locally as "lauan," yielded by species of Pentacme, Shorea, and Parashorea, and "apitong," yielded by species of Dipterocarpus; the former are slightly harder but similar to white pine, while the latter compare with the hard pines.

A paper on Indian State forestry, by Mr. S. Eardley-Wilmot, late Inspector-General of Forests, is published in the Journal of the Society of Arts (April 1). He mentions that the forest department has control over an area of 240,000 square miles—about one-fifth part of British India—from which 4½ million tons of timber and 180 million tons of bamboos are extracted annually. A rough demarcation of the forests is indicated as follows. They range from a height of 14,000 feet, where birch and firs supply the chief constituents, to the mangrove belts situated at sea-level. At an altitude of 8000 feet rhododendrons, oaks, cedars, and pines flourish in different regions. *Dalbergia Sissoo* and *Acacia Catechu* grow in the submontane forests. The deciduous forests at a lower elevation supply teak, sál, ebony, and ironwood, while important evergreen forests are found near the coast or further inland.

A number of interesting problems receiving attention at the Swedish Royal Forestry Institute are detailed in the Proceedings (*Meddelanden från Statens Skogsförsöksanstalt*, part vi., 1909), such as the examination of the native forests from an ecological standpoint, the best trees to plant on heath or swamp land, and the improvement of regeneration by the selection of seed. In connection with the last problem, Dr. N. Sylven communicates the results of his attempt to identify different races or types of the spruce; he distinguishes five types, according to their mode of branching, of which the so-called "kamm" type is recommended as the best seed-bearer. An extensive paper by Mr. E. Wibeck deals with the extent of the beech forests in Sweden, showing that the area has decreased greatly in a period of 200 years, having been reduced partly by human agency, by fires, for the manufacture of potash, and by excessive cutting, and partly by natural causes, such as the intrusion of the spruce.

Two articles by Mr. R. Thomson on the Jequié Manicoba rubber tree, *Manihot dichotoma*, published in the *Indian Forester* (vol. xxxvi., Nos. 1–3), contain suggestions which appear to be worthy of careful consideration. This species, indigenous to the State of Bahia, in Brazil, forms a tree about 20 feet in height, and develops a stem 20 inches in circumference. The author contends that, being much smaller than the Para rubber tree, there is less production of useless material, and that it could be planted more closely, so that by planting 1200 specimens to the acre he estimates a production of 600 lb. of rubber per acre in the fifth year. It is further suggested that climatic difficulties might be overcome by a system of cultivation in rough sheds, such as is adopted in California for growing pine-apples.

TINCTORIAL CHEMISTRY, ANCIENT AND MODERN.

IN his recent presidential address to the Society of Dyers and Colourists Prof. Meldola touched upon several matters of general interest and importance. Referring to the substitution of synthetical for natural dyes, which has entailed great changes in the dyer's methods, he said:—"Such a revolution in an industry of venerable antiquity as has been effected in about half a century has, perhaps, never before been witnessed in the history of applied science. Scientific discovery has, it is true, called new branches of industry into existence, and has thus opened up new fields of human enterprise and outlets for capital and labour. But in this case there has been no new creation; an ancient industry at the touch of science has become transformed.

"If it be asked to what cause or causes this rapid development is due, there can be only one answer—the development of the science of organic chemistry. From the time of Perkin's discovery of mauve in 1856, down to the very latest patents for new dyestuffs, it has been science, and nothing but science, all along the line."

It is, of course, equally true, as Prof. Meldola has himself pointed out elsewhere, that the development of the science of organic chemistry has been greatly accelerated by the large amount of research work carried out in the laboratories of the large German colour manufactories. In regard to the general question of the interdependence of science and industry, he has been one of the chief propagandists for the last twenty-five years, on the platform and in the Press; and on this matter he said:—"It has long been familiar to students of economics—whether we in this country recognise the doctrine or not—that industrial development is ultimately dependent upon scientific development. Fiscal considerations may have some influence in promoting or retarding an industry, but primarily the financial economist, as well as the political economist, is dependent upon the materials supplied by productive industry, and the production of these materials in the most advantageous way and the addition of new materials to the resources of civilisation is the business of scientific research, and it is, therefore, scientific activity which is the real and solid basis of national prosperity. The nation which fails to realise this principle is bound to go under in the long run in that industrial struggle which is certain to become keener with the progress of science and the severity of competition arising therefrom."

This primarily important matter cannot be too often brought forward, but, at the same time, although we have much leeway to make up before we come abreast with our chief industrial competitors, there are signs that at last the nation *is* "waking up" to realise the position. The daily Press, as reflecting the average interests of the public, is now paying an increasing amount of attention to scientific matters. It is no doubt an easy matter to be adversely critical in regard to the quality of the science which is served up in our morning paper, but that is easily remedied, and the all-important matter is that science is fast achieving a prominent place as a current newspaper topic.