The administration of the engineering foundation is conducted by sixteen members elected by the United Engineering Society, thirteen of whom must be members of the founder societies. Although finally organised only in the early part of 1915, the foundation has become thoroughly established, and is carrying on a most admirable work.

A. P. M. FLEMING.

African Softwoods for Pulp Production.

By A. H. UNWIN,
Late Senior Conservator of Forests, Nigeria.

ABOUT the year 1907, at the instigation of the late Sir Alfred Jones, an inquiry was addressed to the West African Colonies with regard to the softwoods suitable for paper or pulp production. As a result a list was compiled for the Benin country, which included some twenty species of whitewood. Since that date little or nothing has been done towards the solution of this problem. Nevertheless, much greater knowledge has been obtained of the softwoods of the West African Colonies—the Gambia, Sierra Leone, Gold Coast, Nigeria—and of West Africa generally.

Although baobab (*Andansonia digitata*) has been suggested as suitable, it is usually found rather remote from navigable waterways, and in such scattered quantities that it is doubtful if its exploitation will pay. On the other hand, the wood of the cotton-tree, *Eriodendron anfractuosum* and *E. orientale*, has been adversely reported upon, but it does not appear that very exhaustive experiments were made with either of these species. The ease of its production, the rapidity of its growth, and the softness of its wood would seem to commend the cotton-tree for pulp production. The wood of *Bombax buonopozense* may also be of use.

Perhaps a more suitable wood will be obtained from the African maple, *Triplochiton Johnsonii* and *T. nigericum*. The wood of both these species is of about the same hardness as that of spruce. It is of a similar colour, and the fibres are long. The tree is very prevalent, its reproduction easy in the proper localities, and its growth rapid. On average soil the trees reach pulp-wood size within ten years, and there are many specimens even in seven years.

In certain localities the occurrence of *Sterculia Barterii* is such as to redden the hill-sides with its flowers in March. The growth of the tree is very rapid, and the wood is fibrous and porous. The tree will attain pulp-wood size in five years. In suitable localities the natural reproduction from mature trees is rapidly filling the whole forest.

Other Sterculiæ, such as *tomentosa*, *rhinopetala*, and *tragacantha*, might be used. Of these the last-named appears to be the most suitable. It is also very prevalent, and grows rapidly. The wood of *Sterculia rhinopetala* may prove to be a little hard, but with modern means of pulping it may be possible to use all these species at the same time.

The quantity of bamboo on the West Coast of Africa is negligible though the area of its distribution is gradually widening.

The Albizzias usually produce in their younger stages a whitish-yellow softwood. Most species grow very fast, and would yield pulp-wood within ten years. The wood shows long fibres. Owing to the prevalence of the tree in the forests, there would be no difficulty as to the quantity. The wood of *Terminalia superba* should prove of value, though its brownish tinge may have to be removed in order to make the best-coloured pulp. It is prevalent and its growth is rapid.

Another very common tree is *Alstonia congensis*, which is often found in the swamps as well as in the moist forests. Its growth is very rapid, and it would yield pulp-wood in seven years. Owing to its prevalence, this softwood with its longish fibre should prove of value.

The wood of *Ricinodendron Heudelotti* appears to be suitable, though the colour is dull grey-brown. The tree is very prevalent, and its natural regeneration prolific. It reaches pulp-wood size within a period of seven to ten years. *Pycanthus kombo* is another tree which appears to yield a suitable species of timber. It is very prevalent, the wood is soft and fibrous, and natural reproduction is great. Even the much-despised *Musanga Smithii* might on occasion be used to supplement inadequate supplies of other pulp-wood timbers. Near the rivers in some districts there is a common tree named Otu, which is planted by the natives. It yields a soft whitewood which has a longish fibre.

With the great shortage of paper-pulp it appears that the utilisation of these West African species of trees should be undertaken as soon as possible. Naturally, it will mean a good deal of experimental work, but with the experience already gained in Canada and Norway and Sweden it should be possible to produce pulp below existing cost. Although African labour is expensive as compared with Indian or Burman, it has proved itself thoroughly adaptable to training in the use of complicated machinery such as that employed in shipbuilding and in oil- and saw-mills.

With a population of about sixteen millions of people in Nigeria alone, it has been found possible gradually to obtain sufficient men for a new industry.

Effect of Topography on Precipitation in Japan.

CONSIDERABLE attention has been directed recently to the subject of the orographical distribution of rainfall, and results obtained in different places are liable to lead to general deductions, not only independent, if not quite contradictory, but also, on the face of them, improbable. We may instance an alleged connection between Indian monsoon intensity and the extent of local water surfaces, and also M. Mathias' cartographical demonstration that the increase of precipitation with altitude is directly dependent on the latitude, at any rate in France. Mr. Carle Salter's lecture to the Institution of Water Engineers on the relation of rainfall to configuration gave little ground for suspecting either of these possibilities.

At first sight, Prof. Terada's contribution in the Journal of the College of Science, Tokyo Imperial University (vol. xli., art. 5), appears to be only a supplement to previous work of Profs. Nakamura and Fujiwhara, but one or two comparatively fresh notes are struck. Prof. Omori had previously found a correlation between earthquake frequency in some districts and precipitation in others. This is now described by Prof. Terada as a case more of parallelism than of cause and effect, for he prefers to attribute both phenomena to barometric changes rather than to associate the instability of the soil with percolation. His main purpose, however, is to study the effect of the discontinuity of wind velocity on land and sea, and for this purpose he divides Japan into six districts, three facing the ocean and three the Japan Sea, and in each district chooses two or three stations near the coast.

The three "ocean" divisions show a marked increase in rainfall with decreasing latitude, but on the con-