Tectonic Framework of China

PROF. J. S. LEE delivered a lecture before the Geological Society on June 5 on a subject of which he is the leading authority: "The Structural Pattern of China and its Dynamic Interpretation". Since the time of Suess, it has been generally accepted that the structural framework of eastern Asia consists of a series of arcs with the 'Amphitheatre of Irkusk' as their common centre. Modern researches, however, have shown that each of these arcs embraces features of different tectonic origin. Three main groups of structural elements are now recognised: (*a*) the Cathaysian geosynclines and their complementary geanticlines; (*b*) the east-west zones; and (*c*) the shear-forms. These seem to be fundamentally independent of each other, although they sometimes fall in line and sometimes interfere.

The Palæocathaysian geosyncline existed as an epicontinental trough, more or less parallel with the eastern border of the continent, so far back as late Pre-Cambrian time. A remnant of its borderland still remains in the coastal belt of south-eastern China. Prof. Lee traces its history to Permo-Carboniferous times, when it formed the eastern extension of the Tethys, and on to the Triassic when it formed the Mesocathaysian geosyncline. It was completely filled in during the Lower Jurassic, and since then China has remained continental. Modern features arose from Jurassic-Cretaceous movements and some of them followed the old-established lines, with the result that geosynclines and geanticlines of the Cathaysian type can still be recognised. One of the present-day troughs is occupied by the Sea of Japan and the Yellow Sea; another, farther inland, stretches from the plain of Manchuria to the Central Yangtze Basin and is named the Neocathaysian geosyncline.

The east-west zones, tabulated below, exhibit a rhythmic orogeny that is one of the most striking tectonic phenomena of eastern Asia. It will be noted that the interval between the ranges is 8° of latitude in every case.

The third group of features includes various shear-forms, of which three types predominate. One of these forms consists of a series of nearly parallel folds trending north-east or north-west and is known as the ξ type. These are commonly traversed by faults roughly perpendicular to the axes. Another consists of a frontal arc with a radial backbone, somewhat after the fashion of a bow and arrow, and is called the ε type. The third is a bundle of folds curving round an old massif or mountain mass and is designated the η type.

Orogenic Epochs	Ranges and their latitudes			
	Tannu-Kentai 49°–50°N.	Inshan 41°–42°N.	Tsingling 33°–34°N.	Nanling 25°–26°N.
Tertiary	—	×	?	?
Jurassic-Cretaceous	×	×	×	×
Hercynian	?	?	×	×
Caledonian	×	—	?	×
Pre-Sinian	×	×	×	×

Consideration of the mechanics, supported by experimental reproductions, leads Prof. Lee to the belief that the shear-forms imply horizontal shearing movements of the upper layer of the continental mass, directed on one hand against the Tibetan massif or the shattered ends of the east-and-west ranges, and on the other against the border of the continent. The other features also suggest southerly movement of the continental mass, and it is suggested that the driving force might have been supplied by an increased speed of rotation of the earth due, for example, to concentration of mass in the interior or to bodily contraction of the earth as a whole. An attempt is made to test the hypothesis by the distribution in time and place of the marine transgressions of the past, some twenty-one of which (major cycles) are recognisable since the beginning of the Cambrian. For a more extensive summary of the lecture, reference should be made to *Abs. Proc. Geol. Soc. London*, No. 1298, June 17, 1935.

Return of Mineral Elements to the Soil by Plants

IT is not generally known that plants can return to the soil at some stage of their growth, either after the first burst of vegetative activity or after maturation of the fruits, certain of the more important nutrient elements which they have absorbed.

Until recently the evidence was meagre, but a series of papers published in Bucharest by Prof. Deleanu and his colleagues[1–3] recording the result of investigations into the function of mineral elements in the life of the plant, has added considerably to our knowledge of this phenomenon.

In 1908 Prof. Deleanu himself[4] found that there was a reversal of the process of absorption of soil constituents, called by him 'negative migration', which occurred in oat plants after they had reached maximum growth, the loss being 64 per cent of the ash elements and 47 per cent of nitrogen. In 1919 J. S. Burd[5] recorded that with barley grown on two different soils, the initial progressively increasing rate of absorption of the soil constituents during the early stages of vegetative development was followed by a period of actual loss, coincident with the development of the heads, and succeeded by renewed absorption at a later period. The absorption and loss were most marked in the elements potassium and nitrogen. In maize the rate of absorption decreased considerably prior to head formation, though no actual loss of soil constituents was found[6]. Plants such as the potato, on the other hand, show no such striking change in the rate of absorption.