regarded as an ancient peat deposit that, through bacterial and other chemical agencies and the heat and pressure developed through burial beneath younger sediments or through crustal movements of the earth, has been converted into a compact mineral fuel. A few coals, such as splint coals, cannel coals, and boghead coals, which are composed largely of wind- and water-borne plant cuticles, spores and pollen-coatings, and waxy and fatty algæ, have been formed principally of aquatic organisms, both plant and animal, but the majority of ordinary coals, designated as humic or xyloid coals, are believed to have been formed mainly from terrestrial vegetation, consisting largely of forest growth. In this respect, the bogs that gave rise to the coal deposits differ somewhat from the common present-day peat bogs, the vegetation of which consists principally of grasses, mosses and turf. One of the most accessible modern fuel-peat bogs in Canada occurs at Alfred, Ont., 45 miles east of Ottawa. Over much of the plains region of Alberta and Saskatchewan, the coal deposits are still in about the same attitude in which the material accumulated, but elsewhere the seams are generally gently to steeply inclined. In places the coal seams are greatly disturbed, being vertical or even overturned, and associated with folded, faulted and plunging structures that reveal great variations of attitude when traced along their trend. Such changes in the attitude and nature of the deposit have, in a number of fields, proved to be the controlling factor in the economic development of the deposit.

Chemical Composition of Coals.—Regarded chemically, coals consist of an organic complex derived from the destructive distillation of two principal plant constituents, lignin and cellulose, and composed of the elements carbon, hydrogen and oxygen in various combinations associated with minor amounts of nitrogen and sulphur. For all practical purposes, coals may be considered as composed of four principal components, moisture, volatile matter, fixed carbon and ash, the latter consisting largely of transported mineral matter. The proportion of these four ingredients vary in different coals but, with the exception of the ash content which is largely accidental, are relatively the same in coals that have a common origin and that have been subjected to about the same degree of metamorphism. Thus in the evolution of coal from peat to anthracite there is a progressive increase in fixed carbon and a corresponding decrease in moisture and volatile matter. Accompanying the change in physical and chemical character there is a corresponding change in the heat value of the coal as determined in calories or British thermal units, the maximum heat value being contained in coals in which the fixed carbon and volatile matter components are most effectively balanced rather than in those coals having the highest percentage of fixed carbon.

Geological and Geographical Distribution of Coal Deposits in Canada

The coal deposits of Canada occur in formations of at least five geological ages. The oldest coal deposits of mineable thickness are those of Carboniferous age estimated at roughly 250,000,000 years old. These occur in several Pennsylvanian formations in Nova Scotia, New Brunswick, and some of the Islands of the Arctic Archipelago. Next in age are coal deposits occurring in northwestern British Columbia and Yukon of possible Jurassic age estimated at roughly 175,000,000 years old. Closely following these are the coal deposits of Lower Cretaceous age estimated at approximately 150,000,000 years old. These embrace the lignite deposits of the Onakawana Field of northern Ontario and the coal deposits of the Kootenay and Luscar formations that outcrop along the inner foothills belt of the Rocky Mountains in Alberta and eastern British Columbia. These are succeeded