DIGESTION OF FOOD.—The Scientific *American* says that of all articles of food boiled rice is digested in the shortest time—an hour. As it contains eight-ninths nutritious mattter, it is a valuable substance for diet. Tripe and pigs' feet are digested almost as rapidly. Apples, if sweet and ripe, are next in order. Venison is digested almost as soon as apples—Roasted potatoes are digested in half the time required by the same vegetables boiled, which occupy more than three hours and a half—more than beef or mutton. Bread occupies three hours and a quarter. Stewed oysters and boiled eggs are digested in three hours and a half—an hour more than is occupied by the same articles raw. Turkeys and geese are converted in two hours and a half, an hour and a half sooner than chickens. Roasted veal, pork and salt ted beef occupy five hours aud a half—the longest of any article of food.

THE IMMENSITY OF THE UNIVERSE.—As a proof of what an immense book the heavens are, and also of the indefatigability of the student man in turning over its leaves, Doctor Nichol, in his work describing the magnitude of Lord Rosse's telescope, says that Lord Rosse has looked into space so tremendous, so inconceivable, that light which travels at the rate of 200,000 miles in one second, would require a period of 250,000,000 of solar years, each year containing about 32,000,000 of seconds, to pass the intervening gulph between this earth and the remotest point to which his telescope has reached! How utterly unable is the mind to grasp even a fraction of this immense period, to conceive the passing events of a hundred thousand years only is an impossibility, to say nothing of millions and hundreds of millions of years. The sun is ninety-five millions of miles from the earth, yet a ray of light will traverse that immense distance in 480 seconds, long as the distance may have seemed to be passed in so short a time, what comparison can the mind frame between it and that greater distance, which Doctor Nichol and Rosse demonstrate would require every second of that time to represent more than five hundred years! And recollect the study of astronomy is not only useful to excite the emotions of grandeur and sublimity at such discoveries, but it is the basis of navigation and of our note of time, and unites the strictness of mathematical reasoning, and the most certain calculations.

ON THE PHYSICAL STRUCTURE OF THE WESTERN DISTRICT OF UPPER CANADA.

BY W. E. LOGAN, F.R.S., AND DIRECTOR OF THE GEOLOGICAL SURVEY OF CANADA.

The Western District of Upper Canada has, at a short distance on the north-west side of it, the coal-field of Michigan, and at a somewhat greater on the south-east, what has been called the coal-field of Appalachia. The former, as has been ascertained by the investigations of the geologists of the United States, occupies the chief part of the interior of the southern peninsula of Michigan, and has a superficies of about 12,000 square miles, while the latter, extending in length from the north-eastern corner of Pennsylvania to Tennessee, and in breadth from the vicinity of Lake Erie to the sources of the Potomac, presents the greatest known carboniferous area on the face of the globe, its surface being equal to about 60,000 square miles. The rocks of the Michigan coal-field, where they approach nearest to Lake Saint Clair, and those of the Appalachian, where they do the same in regard to Lake Erie, exhibit an attitude so near to horizontality, that without accurate admeasurements, it would not be easy to detect their dip. Those between the coal-fields and the two Lakes equally do so, and those again between the Lakes themselves are, as a whole, flatter still. The Western District, thus flanked on both sides by coal measures, and showing no easily observed reason in the dip why they should not be carried across it, might induce those who had made no careful examination of the matter to entertain a hope that some outlaying patch of such measures might yet be found in that part of Canada. The ascertained structure of the District, however, shows that such a hope would be ill founded; and I propose to place before the Institute an explanation of what that structure is, illustrated by a map and section, that part of the map representing a portion of the United States being copied from the works of American geologists.

The rocks comprehended in the section in descending order are—

1. Gneissoid, or Metanorphic series.	
2. Huronian, or copper-bearing rocks, perhaps equivalent to the Cambrian of England.	
3. Potsdam Standstone.	
4. Calciferous Sand-rock, Chazy, Birdseye, Black River, and Trenton Limestones.	Lower Silurian.
5. Utica Slates.	
6. Hudson River group.	
7. Median Standstone.	
8. Clinton and Niagara Groups.	
9. Gypsiferous Rocks, or Onondaga Salt group.	Upper Silurian.
10. Corniferous limestone.*	
11. Hamilton group	Devonian.
12. Chemung and Portage groups.	
13. Mountain or Carboniferous Limestone.	Carboniferous.
14. Coal measures.	

It is not my intention to give any detailed description of these rocks, but for their mineral and fossil contents, as well as their respective thicknesses, refer to the various official reports presented to the government on the progress of the geological survey of the Province, and of those of the geologists of the United States; nor shall I allude to their geographical distribution in detail farther than as occasion may require, the map being sufficient to explain it.

Taking these rocks in their general groupings, it will be perceived by the map that the Lower Silurian series, by a change in the strike from north to north-west, sweeps round from Lake Ontario to Georgian Bay, and proceeds thence by the north side of the Manitoulin Islands, and the north shore of Lake Huron, to the northern peninsula of Michigan. The upper Silurian follows them. The Niagara Limestone at the base, aids in forming the neck of Land separating and holding up Lake Erie from Lake Ontario, and continues in a ridge along the Blue Mountains, and the promontory terminating at Cabot's Hea , and Cape Hurd, of which promontory the chain of the Manitoulin Islands is only an interrupted prolongation. The Gypsiferous rocks succeed conformably, running from Grand Island by the Welland and Grand Rivers, to the River Sauguine, while the superimpoised Corniferous Limestone, from Lake Erie on the one side and Lake Huron on the other, is projected forward into the Western District as far as the Township of Zone. The same formation, with a projected form in an opposite direction, comes up from Ohio by the upper end of Lake Erie, and is carried north-easterly as far as the eastern side of Chatham.—Between Zone and Chatham, the Hamilton group composed of black bituminous shales, constitutes a narrow band, which runs north-westward towards Lakes Huron and St. Clair, and south-westward to Lake Erie, gradually widening in both directions in the surface it occupies, and finally merging into two rings, or irregular circular belts, one of which is rudely concentric with the coal measures of Michigan, and the other with those of the Appalachian field—of which last, however, the map shows but a small portion. Within these two rings, thus united by the band across the Western District, and between them and the carboniferous centre, the Chemung and Portage groups occupy their place, in two broad and entirely separate zones, one of them shewing itself north-west of St. Clair, and the other south-east of Lake Erie.

To any one accustomed to consider the forms derived from the intersection of surfaces, who will carry in his mind that the various formations which have been given are nothing more than a set of thick, close-fitting and, conformable sheets, which are intersected by the general surface of the country, it will be at once apparent that the ascertained geographical distribution of the formations results from the fact that between the Michigan and Appalachian coal-fields there is a flat anticlinal arch, the axis of which runs with a gentle curve, from the upper extremity of Lake Ontario by London, Zone, and Malden, to the Maume River, at the upper end of Lake Erie, and that between Chatham and Zone there is in it a slight transverse depression. This anticlinal arch is represented in the section, the line of which runs in a north-west and south-east direction from the one coal-field to the other, a little south-west of the Hamilton Shales in Chatham. The section is given on a scale of one mile to an inch, both horizontally and vertically; for it is only by using the same scale for both measurements that a true idea can be at once conceived of the very small slope in a set of strata that is required to produce important effects in geographical distribution.

It will be seen by the section that between the highest formation in the Western District (the Hamilton group) and the Carboniferous series, the rocks that are wanting (the Chemung and Portage groups) have a thickness of about 2500 feet, and without a very extensive area of these, there can be no reasonable expectation of coal.

The position of the great Lakes of the St. Lawrence, and the distribution

* What is called the Corniferous limestone, under No. 10, is intended to represent whatever there may be in Canada of those deposits which, in the New York series of rocks compose the Heiderberg series, with the exclusion of the Onondaga Salt group; and it may be remarked, that the line of division between the Upper Silurian and Devonian rocks is given as merely approximative. The true position of this line seems as yet not quite certain, but it is supposed to be somewhere about the middle of that portion of the Helderberg series, which lies above the Onondaga Salt group.