geology of the route, there is not a word about his fossil find at the Chaudière, the great falls (as they then were) at the foot of which the settlement of Hull had been established, soon to be also the site of Bytown, predecessor of Ottawa.

In a discussion of the fossil shown on the medal, published in 1908 by F. A. Bather, its discovery in 1822 is described and it is there related that it was brought to England (or sent?) by Bigsby in 1825 in which year it was described by G. B. Sowerby. He did not, however, name the fossil which was presented to the Museum of Practical Geology on Jermyn Street, London by Dr. Bigsby in 1848.

The specimen was seen and discussed by Professor E. Forbes in England, an authority on echinoderms, who was writing his memoir "On the Cystidae of the Silurian Rocks of the British Islands". In the meantime, Billings had collected further specimens from the 'Trenton' Limestone at Ottawa that he assumed to be the same as the Bigsby specimen, but when he compared them with the original in London he found that they differed considerably. By this time Billings had named his own specimens after Bigsby and in 1858 he writes of *Edrioaster bigsbyi:*

> "I regret, that, in consequence of mistaking the meaning of Prof. E. Forbes' remarks on the genus *Agelacrinites* in his memoir on the British Cystidae, I supposed this to be the specimen discovered by Dr. Bigsby, and accordingly gave it his name. Since then I have seen Dr. Bigsby's specimen, and find it to be *A. Dicksoni.* It is too late now to change the names."

Bigsby's historic specimen came out second best and was named *Agelacrinites dicksoni* by Billings, after Andrew Dickson of Kingston, "one of the best workers in the field of Canadian geology" and one of the founders of the Ottawa valley town of Pakenham. From a zoological standpoint Bigsby was the real winner because when it was realized that these elegant, starfish-like fossils were a distinct group of organisms, *Edrioaster bigsbyi* became the species typifying the class and the generic name *Edrioaster* proposed by Billings in 1858 became enshrined in the hierarchy of biological classification as the Edrioasteroidea, an extinct class, known only from the fossil record.

Thus a sequence of events in the Province of Canada many years before Confederation resulted in a medal to honour men of science and a permanent contribution to the classification of the animal kingdom.

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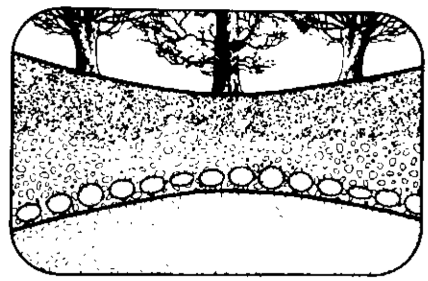
MS received, August 23, 1974.

The Soil Column



Interpreting Soil Survey Information

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Various studies have been undertaken by soil scientists, economists and others to determine the present capacity for production as well as to estimate potential production of Canada's land. The Canada Soil Survey program has attempted to interpret information provided in soil maps and reports in such a way as to provide production estimates.

Some early soil reports grouped the soils into Adaptability Classes or Ratings for agriculture. Soils were grouped into good, good to fair, fair to poor and poor classes based on their ability to produce the crops commonly grown in the region. These ratings simply indicate that one soil is better, worse, or the same as another soil for the production of a particular crop. In a few cases the ratings are made more meaningful by defining good, fair, etc., in terms of reported yields. It was not until the beginning of the Canada Land Inventory (CLI) studies that concerted efforts were made to group soils into production units for uses in addition to agriculture.

The CLI developed a system that grouped soils into seven classes with class 1 being best and class 7 being worst for a defined use. The classes are subdivided into subclasses the number of which varies according to the use. The subclasses indicate the kind of limitation, such as wetness, slope, stoniness, depth to bedrock, etc., and the classes indicate the degree of the limitation. Capability classifications were developed for four uses; agriculture, forestry, wildlife and outdoor recreation. The class is assigned to a site on an estimate of potential yield of common field crops, wood, wildlife or visitor days depending on the use. The estimate is a "value judgement" based on the experience of the person rating the site. Like the "Adaptability Ratings" the soil capability only indicates that one site is better, worse or the same as another for a defined use. It does not indicate "best use" or profitability.

Descriptive terms are used to define each of the seven classes in each system. None except forestry, have used quantitative measures of yield to indicate differences in class. The system for forestry defines class 1 as having a productivity of wood greater than 111 cubic feet per acre per annum, class 2 a productivity of 91 to 110 cubic feet per acre per annum and by 20 cubic foot classes thereafter as required. There has been some interest in the quantitative definition of the classes for the other uses in some parts of Canada.

In Ontario, there was a desire to define each of the soil classes for agriculture in quantitative production terms. One of the first to attempt this was Noble (1965) who related soil class to income from dairying on 299 farms in Eastern Ontario. Gross farm incomes were found to be closely related to the kinds and amounts of soil available per unit. In addition economic and social variables associated with farm types and farm classes were studied. These studies indicate that a significant difference in income from dairying occurs at least for classes, 1, 2, 3 and 4. In 1967 Noble reported on the sociological aspects of the Eastern Ontario Farm family to complete his study of the relationships among soils, dairying, incomes and the farm family.

This study was followed by a different series of studies designed to estimate the yield of selected crops by soil class and to develop mathematical models for predicting the yields of these crops. Models for predicting yields of grain, corn, oats and barley were determined (Hoffman, 1971) and indices assigned to each class. Similar information was gathered for hay (Anderson, 1971). Some idea of the kind of model developed for predicting yield can be gained from the following which is that developed for barley.

$$Yb = 131.84 - 14.13\,(\text{class}) + .12(N) + .06\,(\text{clay}) - .61\,(\text{temperature})$$

Yb is yield of barley, class is soil capability class, N is the amount of nitrogen added to the soil, clay is the clay content, and temperature is the mean air temperature during the growing season.

Indices showing the differences in productivity between classes are given in Table I.

Table I

Comparison of performance indices for soil classes developed from yields of common fields and farm income from dairying (Noble, 1965).

Class	Yields of Common Field Crops	Noble's Adjusted Acres
1	1.00	1.00
2	.80	.87
3	.65	.75
4	.55	.33
5	.50	.25
6	.44	.20
7	No Value	No Value

The use of such information for planning for agriculture is discussed in Agricultural Rehabilitation Development Act (ARDA) Report #7 (1972).

Soil capability classifications can be used to interpret soil and geological information for uses in addition to those studied by the Canada Land Inventory. For example soils can be grouped on the basis of properties likely to affect their use for construction purposes. A 5-class capability classification for urbanization has been developed which uses properties of soil and sediment to rate sites for construction purposes. The properties are summarized in Table II. Also so shown are subclass limits which permit the user to compare several sites as to their capability for construction.

Capability classifications are not the only way of interpreting soil survey information. There are many others. However, capability does have a value for decision making since it provides an evaluation of "productivity."

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Table II
Soil Capability for Urbanization

Soil and Site Factors	Subclass Symbols	Capability Classes				
		1	2	3	4	5
Depth to Bedrock	R	>20′	8 – 20′	0 – 8′	0 – 8′	0 – 8′
Depth to Water Table	B	>20′	>20′	8 – 20′	0 – 8′	0 – 8′
Slope – per cent pattern	T	0 – 5% – Aa, Bb	6 – 9% – C	6 – 9% – c 10 – 15% – D	16 – 30% – d	>30%
Stoniness	P	Classes 0, 1	Classes 0, 1	Class 2	Class 3	Class 4
Natural Drainage	W	good	moderate	imperfect	poor	very poor
Texture	A	loams clay loams	f. sandy loams clays	loamy sands gravels	silts v.f. sands	any texture with high water table
Structure	D	strong, granular blocky; porous; water stable	moderately strong granular or blocky; porous; water stable	weak granular or blocky;	structureless	structureless, unstable
Impermeable Layers	Y	none	one or more >3 ft. deep	one or more 2 – 3 ft. deep	one or more 1 – 2 ft. deep	one or more 1 ft. deep