data were found to characterize colour much better than present terms, such as "pale yellow", "dark red", etc. The following data were obtained from six of the samples studied:

Substance	Trichromatic coefficients x	y	z	Usual colour designation of powder
Azurite	.1675	.2311	.6014	Blue
Malachite	.2867	.3485	.3648	Pale green
Synth. K_2CrO_4	.3905	.4449	.1646	Canary yellow
Calcite	.3140	.3220	.3640	White
Synth. Fe_2O_3	.4009	.3357	.2634	Reddish brown
Cinnabar	.4148	.3198	.2654	Scarlet

Reflectance data not only characterize colour, they can be used also to determine the amount of coloured material present in a binary mixture such as hematite and quartz. This yields the following results:

Weight % Fe_2O_3 in SiO_2	Reflectance (%) at 620 μ
0.00	88
5.00	54
10.00	47
15.00	43
20.00	39
40.00	36
100.00	30

By means of reflectance it should be possible to determine the amount of mechanically admixed Fe_2O_3 in SiO_2 to within $\pm 1\%$ for samples containing up to 20% Fe_2O_3. This method also has been used to determine the chromophore content in an isomorphous series (Fe in sphalerite).

The availability of reliable, modestly-priced spectrophotometers should make the quantitative determination of colour a routine matter in mineralogy.

THE ROYAL ONTARIO MUSEUM'S NEW GALLERY OF MINERALOGY

J. A. Mandarino

Royal Ontario Museum, Toronto, Ontario

The International Nickel Company gave the Royal Ontario Museum $150,000 to design and build a new Gallery of Mineralogy which will open in November, 1967. This gallery is the first in its field to try to teach mineralogy as well as display minerals.

We thought the layman would better appreciate a display of minerals, if he first learned what minerals are, how they formed in nature, how one mineral can be distinguished from others, etc. Accordingly, the visitor will be introduced to chemistry, crystallography, physical properties, optical properties, x-ray diffraction, identification, and genesis of minerals. Throughout this "course" he can perform scientific experiments himself to help him understand some of these principles. He can prove the Law of Constancy of Interfacial Angles; measure the refractive indices and birefringence; estimate specific gravity; and identify a mineral with a special "computer".

Under most of these teaching exhibits we have installed small cases set at a child's-eye level. Many of these "kiddy" cases have push buttons and cranks which activate

Moire patterns, colour discs, magnets, and other simple scientific devices to amuse and occupy the child.

The teaching section is followed by the Royal Ontario Museum's Gem Collection where the visitor can learn about the properties of gems.

We hope this introduction will better prepare the layman to appreciate the carefully selected specimens in the Systematic Collection which follows, and that he will come away entertained and informed rather than overwhelmed and bewildered.

THE SURFACE EXPRESSION OF KIMBERLITE PIPES

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The recent discovery in Northern Ontario of rocks resembling kimberlite has stimulated interest in the possibility of finding primary diamond deposits in the Canadian Shield. This paper describes the surface expression of kimberlite pipes, particularly citing the features which may assist in the discovery of pipes in overburden-covered areas.

Kimberlite occurs as clusters or lines of dykes and pipes in cratonic areas. The pipes range from a few tens of feet to nearly a mile in diameter and exhibit a wide variety of shapes. Most pipes are less than 500 feet in maximum diameter.

Even in non-glaciated regions, topography, soil, and vegetation rarely indicate the presence of underlying kimberlite. Photogeology and geophysical techniques are useful mainly in outlining known pipes or in finding adjacent pipes once a discovery has been made.

The most diagnostic surface evidence of kimberlite is the presence in residual soil or alluvium, of certain heavy resistant accessory minerals. Magnesian ilmenite, chromian pyrope-almandine garnet, and chrome-diopside are the most useful indicators. The detection of these minerals, and the determination of their distribution, offer the best practical means of discovering unexposed kimberlite pipes. Some applications of the heavy mineral technique in Africa are described.

CRYSTALLOGRAPHIC POLARITY IN CHALCOPYRITE

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Chalcopyrite is a non-centrosymmetric mineral belonging to the space group $I\bar{4}2d$. Natural crystals of chalcopyrite are commonly tetrahedral in appearance, displaying the sphenoidal faces of the form $\{112\}$. The sphenoidal form in itself lacks a center of symmetry and thus the morphology of most chalcopyrite crystals immediately reveals the polar character of the mineral. In cases where both sphenoidal forms are present, one usually dominates while the other is considerably inferior in size. The large face, designated as $\{112\}$, is always dull in lustre or oxidized and striated parallel to $[1\bar{1}0]$; the faces of the $\{\bar{1}\bar{1}\bar{2}\}$ are small, brilliant, not striated, and not oxidized.

The crystallographic polarity of chalcopyrite has been established by x-ray diffraction intensity measurements considering anomalous dispersion effects. Consistent with theoretical calculations, the geometric structure factor for x-ray scattering was found different in opposite directions along the [112] polar axis. Consequently, the two types of surfaces perpendicular to the polar axis were identified. The etching behaviour of these surfaces was correlated with the x-ray results so that simple etching tests were developed for the differentiation of $\{112\}$ from $\{\bar{1}\bar{1}\bar{2}\}$.