disciplines in resource probability modeling at all stages of assessment, constitutes the scenario under the theme of technical perspective.

The utility of mineral deposit (tonnage and grade) models in regional assessment are necessary and relevant to increase communication with the policy community as they provide a measure of the magnitude and quality of undiscovered deposits. Exploration models fulfilled the scientist's needs for rigor in his work and confidence in his location of areas of mineral potential. The economics of mineral supply comprising the costs (C) risks (p) and returns (R) is a three phase process. The expected value (EV) of the mineral supply process per economic discovery is expressed as :

$$EV = R - E = R - (C/p)$$

where E (Exploration Expenditure). The theme on 'Conclusions and Critiques' incorporates such discussion parameters.

Several related matters right from appraisal to management of mineral resources with specific case studies chosen from different geological milieu are cogently presented in this monograph. It will be a useful addition to institutional and individual libraries. The data is worth perusing by every practising earth scientist, to know what is happening elsewhere and to adapt such an approach if placed under similar circumstances and environment. It is a purposeful contribution by the U.S. Geological Survey which every academic and practical earth scientist must read to get educated.

Hyderabad P. K. RAMAM

Notes

AN APPROACH TO STYLE

The use of language begins with imitation. . . . Never imitate consciously, but do not worry about being an imitator; take pains instead to admire what is good. . . . Before beginning to compose something, gauge the nature and extent of the enterprise and work from a suitable design. Design informs even the simplest structure, whether of brick and steel or of prose. . . . Revising is part of writing. . . . Few writers are so expert that they can produce what they are after on the first try. Quite often you will discover, on examining the completed work, that there are serious flaws in the arrangement of the material calling for transpositions. . . . . Remember that it is no sign of weakness or defeat that your manuscript ends up in need of major surgery. This is a common occurrence in all writing, and among the best writers. . . . Overstatement is one of the common faults. A single overstatement wherever or however it occurs, diminishes the whole, and a single carefree superlative has the power to destroy, for the reader, the object of the writer's enthusiasm. . . .

Rather, very, little, pretty — these are the leeches that infest the pond of prose, sucking the blood of words. . . .

Writing good standard English is no cinch, and before you have managed it, you will have encountered enough rough country to satisfy even the most adventurous spirit.

EXTRACTS FROM THE ARTICLE BY E. B. WHITE

Span, July 1986

ANSWER FUNDAMENTAL QUESTIONS

A project was assigned to make a better oil lamp. Groups were organised to investigate the qualities of the oil, the oil container, the wick material and shape, and the design of the reflector and the globe. In spite of the improvements which each group made, not one group would have arrived at an electric bulb. They obviously failed to address the right question: how does one make a better light? —not a better oil lamp.

The story illustrates why scientists should address themselves to ask fundamental questions and try to find an answer.

STORY ATTRIBUTED TO IRVING LANGMUIR

FAVOURABLE RECOGNITION BY ONE'S PEERS

. . . Those of us who serve the tax payer in government agencies have little expectation of monetary reward for accomplishments, no patents from which to receive handsome fees, no lucrative positions on the boards of directors of profitable corporations, no share in the benefits from successful mineral exploration, and not even the right to invest anywhere in businesses concerned with minerals. What we do have is an unusually fine opportunity to work with a varied collection of talented colleagues with whom we make studies and publish findings. Other than the satisfaction of having one's works recognized, accolades are scarce. The usual form of recognition is a request for a reprint from a graduate student (whose professor had discovered our article but assigned the reference to the student to have him figure out just what these guys were really trying to say). However, the most treasured response of all is favourable recognition by one's peers.

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. . . Compared with the other physical sciences, and especially when compared with the biomedical sciences, our profession benefits immensely by being a small, relatively close knit group who strive to advance themselves and their science through cooperative studies and free communication and discussion, often well in advance of publication. This tradition is maintained more by imitation than by conscious effort; but it is nonetheless a treasure that should not be dismissed lightly but must be vigorously protected.

P. B. BARTON ON ACCEPTING THE ROEBLING MEDAL
(Amer. Mineralogist, v. 76, p. 650)

LIFELONG LEARNING

At one time, a single stint of university education was sufficient to provide the structural framework for lifelong learning. It was then possible for scientists or engineers to maintain a good level of awareness about progress in much of science or engineering. But the body of knowledge is expanding rapidly, and many new specialities have arisen. In some desciplines, several hundred thousand pages in journal articles appear each year. The usual response of the individual to the flood of knowledge is to become an expert devoted to learning more and more about less and less.

* * * *

A national need exists to foster lifelong learning. This need demands attention and support from universities, industry, professional organizations, private foundations, and the government – Philip H. Abelson, Science, v. 235, p. 521 (1987).

ECONOMIC GEOLOGY AND ITS FUTURE

Economic Geology has been good to me and I care about its future. . . This field is immensely broad. Our knowledge of it remains imperfect. . . Economic geology must therefore not only tolerate but actively seek and encourage a breadth of approaches and dissenting views. Our current procedures in reviewing manuscripts for publication and vetting research grant proposals unfortunately may tend to narrow this scope and suppress the dissent. But surely there is no cause to restrict these for they stimulate further work, expand knowledge, and promote understanding.

R. H. HUTCHINSON
(Econ. Geol. v. 81, p. 228)

THE GLOBAL GEOSCIENCE TRANSECTS PROJECT

The term transect as used by the GGT refers to a cross-section showing the composition and structure of the entire crust of the Earth and, where possible, the lower lithosphere. It incorporates and integrates all available geological, geochemical and geophysical data. Transects lie along corridors 100 km wide and up to a few thousand kilometers long, positioned by regional experts to cross major crustal features. Ideally, they are a type of geological strip map in the vertical plane that can be used to show how the crust represented there formed.

A major purpose of GGT is to encourage preparation of transect displays in a common format, so that crust in different parts of the world can be compared directly. The project is intended to utilize the vast amount of geological and geophysical information, collected partly for economic reasons, that already exists, mainly in national surveys. The quality and availability of these data are best

known and evaluated by local experts. Thus, for the project to be viable, it must involve scientists at the 'grass-roots' level, and give them the opportunity to share in a project of global scope and at the forefront of earth science research.

* * * *

The integration of the different geological and geophysical perspectives is perhaps the major challenge of GGT. This integration has been done in the upper crust for many years, with considerable commerical success by the petroleum industry. Seismic reflection images, particularly the multichannels computer-processed variety, resemble geological cross-sections in that they show the geometry of reflectors within the crust. These images may be readily related to geology where the reflector coincides with a lithological unit or structure that can be directly observed at the surface or in drill holes.

* * * *

Data on the nature and composition of the earth's crust and lower mantle are rapidly being collected by many countries. The Global Geoscience Transects project encourages all countries to use this information in a systematic manner and present it in such a way that the crust in all parts of the world can be directly compared.

EPISODES
(v. 9(4), December, 1986)

DIRECT DATING OF ARCHAEAN STROMOTALITE LIMESTONE

A report has appeared in the columns of a recent issue of Nature (Vol. 326, 30th April 1987, pp. 865–867) which should be welcomed by all those engaged in the study of the Precambrian. It records the first direct dating of the depositional age of a stromotalite-bearing sedimentary carbonate rock of Archaean age by Pb/Pb isochron method. The age is given as 2839 ± 33 m.y. This opens up the possibility of directly determining the time of deposition of Precambrian sediments and in matching of stratigraphic position with isotopic age, a procedure which has eluded geologists so far. The new method when made applicable to Precambrian carbonate rocks will have far reaching effect especially in establishing the antiquity of life and stages through which it has evolved. The authors of the note (S. Moorbath and others) claim that the new technique is extremely promising.

SOCIETY FOR SCIENTIFIC VALUES (SSV)

A new Society has been formed by a group of Indian scientists led by Dr. A. S. Paintal to promote integrity, objectivity and ethical values in the pursuit of science and to evolve a healthy scientific environment free from prejudices, bureaucratic formalisms, dishonesty, propagation of unsubstantiated research claims, suppression of dissent, showmanship, sycophancy and political manipulation.

SSV also prohibited its members from attending conferences in expensive hotels. It also decries the practice of giving prizes year after year to the same group of politically influential scientists, who have long since ceased to do research.

NATURE
(Vol. 326, 9th April 1987, p. 531)