Notes

GEMMOLOGY AS A PART OF EARTH SCIENCE CURRICULUM

India has a long tradition in gemstone industry. Many varieties of precious and semiprecious stones are mined here. Several legendary stones like Koh-i-noor had their home in India. Gemstones cut and polished here have great demand not only in the domestic market but also have helped in earning foreign exchange. Gemmology, however, has not been taken seriously by Earth Science Faculties in India.

It is but natural that when a person buys stones, he consults a geologist because he thinks that gemstones have been studied systematically by the geologist. Similarly, when a layman finds an attractive stone in the countryside he expects the geologist to identify it and asks him whether it can be used as a gemstone. In many cases, the geologist, without a proper background of gemmology cuts a sorry figure in identifying gemstones. Average geology student lacks proper orientation in applying his knowledge in the field of gemmology. As an example, the stone *golden topaz* can be cited. Generally in the Indian market, stones sold in the name of golden topaz is either citrine or yellow sapphire (oriental topaz), but seldom the true topaz. If properly coached it can be identified either by checking RI with a refractometer or by determining its sp. gr. with a balance. In fact, many geologists do not know that yellow citrine sold in the market is carefully heated amethyst.

With the inflow of synthetic stones, the study of gemstones has become more complex and confusing. It is the mineralogist who can offer help in this matter.

Proper orientation in the syllabus can motivate the student of Earth Science to take interest in the field of gemmology. In the University of Bombay, at St. Xavier's College, gemmology is taught as a part of the Earth Science curriculum and it is offered in undergraduate level as an additional paper in geology. However, it is difficult to introduce gemmology in the undergraduate level in all colleges, as it involves collection of expensive gemstones and instruments for identification. It is more appropriate to include it in post-graduate colleges. By the time the student comes to post-graduate level, he will have acquired sufficient knowledge to absorb various intricacies of gemmology. It can be introduced in the Universities in three ways: 1) as a general topic, being a part of mineralogy course; 2) as an independent subject offering special paper in post-graduate level; or 3) as a post-graduate diploma.

In the recent revised edition of *Dana's Manual of Mineralogy*, a chapter on gemmology is introduced (Klein and Hurlbut Jr., 1985). Many authors have written books on gemmology and of these only a few have proper scientific orientation and systematic approach. To the best of my knowledge. *Gemmology* by Hurlbut Jr. and Switzer (1979) would be more useful in the post-graduate level. The instruments required for gemmology can be obtained without much difficulty and they have been enlisted by Read (1983). As a manual for gem cutting and polishing, Sinkanka's *Lapidary's Manual* (1962) would be highly useful.

It is high time that gemmology is taken seriously by geologists in India and the subject introduced in the curriculum of Earth Science. At the same time, research on gemstones should be encouraged keeping in view that India has a large reserve of gemstones and the stones processed here have world-wide market. Research on gemstones could include: 1) discovery of various gemstone deposits of particular regions and cataloguing them systematically; 2) studying interesting properties of Indian gemstones; 3) gemstone enhancement and 4) synthesis of gemstones.

Useful Books on Gemmology

ANDERSON, B. W., (1980) *Gem Testing (9th Ed.)*. Butterworths, London.

HURLBUT, JR. C. S. and SWITZER, G. S., (1979) *Gemmology*. John Wiley and Sons, NY.

KLEIN, C. and HURLBUT, JR. C. E., (1985) *Manual of Mineralogy (After J. D. Dana : 20th Ed.)*. John Wiley and Sons, NY.

LIDDICOAT, R. T., (1981) *Handbook of Gem Identification (11th Ed.)*. Gemmological Institute of America Publication.

NASSAU, K., (1984) *Gemstone Enhancement*, Butterworths, London.

READ, P. G., (1980) *Beginner's Guide to Gemmology*. Butterworths, London.

——— (1983) *Gemmological Instruments (2nd Ed.)*. Butterworths, London.

SINKANKAS, J., (1962) *Gem cutting—A Lipidary's Manual (2nd Ed.)*. Van Nostrand Reinhold Co., NY.

WEBSTER, R., (1983) *[Gems (4th Ed.) : Revised by Anderson, B. W.]*. Butterworths, London.

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SUPPORT FIELD WORK

Governments often do not translate their much publicized desire for resource development into liberal provision for the most meagre requirements of field work. But governments and higher level officials do respond to budget requests for satellite and airborne imagery because, despite all caveats, they look upon the techniques as a shortcut to rapid resource development and a most welcome substitute for distasteful field work.

ON BOOK-REVIEWING

Most book reviews should be essays in sympathetic understanding, marked sometime with sorrow, rarely with anger, and so they usually are.

Book reviewers pursue one of the most honourable of intellectual crafts. The ideal reviewer is a self effacing person—the kind of person who is sufficiently knowledgeable to have written the book he is charged with off his own bat, who might well indeed have done so if he were not so busy, but who has nevertheless been willing to quarry time from a busy time-table to inform and instruct potential readers of a new appreciation in literature. The scientific community—any intellectual community—has reason to be grateful to reviewers. —*From Nature* 290 (1981) p. 633

MOTIVE BEHIND WORK

The greatest workers are as a rule, those who work not for any explicable motive, but because they are possessed by a demon. The Henry Fords, no less than Shakespeare, are men of genius and they must live in slavery to their genius whether it makes them happy or whether it destroys them. One thing is certain, they will be unable to find happiness in anything else. The demon of energy in their bosoms must have an outlet. —*New Statesman*, 13-9-1922

'MY PRIME CONCERN IS ROCKS'

'I am after all a geologist – not a physicist or chemist. My prime concern is rocks, for these are the stuff of which the Earth is made. I have to ask myself, therefore, what does this or that paper tell me about the outcrop in front of me? All too often the answer is 'not much'. Have we in our enthusiasm for the new methods of data collecting forgotten our primary goal? Is it that we have expensive tools looking for a problem rather than a problem requiring an answer by whatever means that are appropriate? The older generation among us had our start in the field. But there is danger perhaps, that we are now training a new generation without that field background without which one cannot distinguish the fundamental from the trivial—the meaningful from the meaningless. —*F. J. Pettijohn*