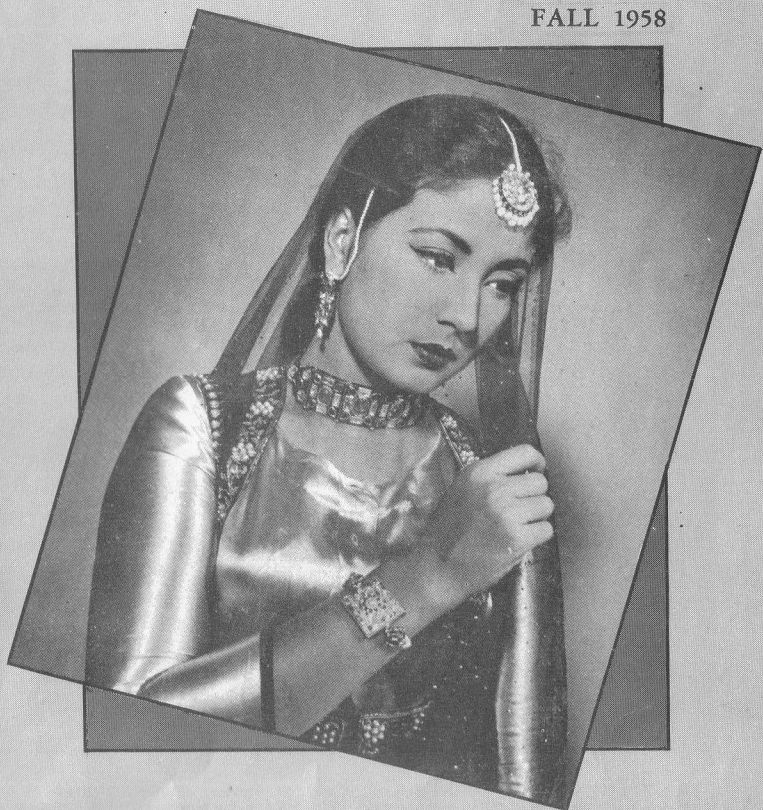


# *Gems and Gemology*

FALL 1958



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# Gems & Gemology

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### On the Cover

*A complete Moghul jewelry ensemble, consisting of necklace, bracelet, earrings, and the traditional tika on the forehead, is worn by the Indian film star, Meena Kumari. The collar and the bracelet are made of enameled gold plate and encrusted with rose-cut diamonds, rubies and emeralds. The back portion of the collar is golden and white silk tassel. For further discussion see article on page 202.*

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# Notes on The New Emeralds from Sandawana

By

DR. E. J. GUBELIN, C.G., F.G.A.

The world's main source of fine emeralds, up to this time, has been the three famous mines of Muzo, Gachala and El Chivor, Colombia, South America, although emeralds are also found in India, Transvaal, Brazil, Urals, the Habachtal (Austria) and a few other minor sources. Therefore, it came as a complete surprise when the news was released that a new, very rich emerald deposit had been discovered near the small valley of Sandawana in the Belingwe area in South Rhodesia.

What two years ago was a crocodile-infested area is now surrounded with barbed wire, and an arc lamp is focused on the broken surface of the new emerald mine.

Since 1954, Laurence Contat and Cornelius Oosthuizen, two South African settlers in Rhodesia, had been mining for pegmatite minerals (beryl, tantalite and the lithium ores) in the Sabi Valley, a remote part of South Rhodesia. They had discovered the deposits, Oosthuizen deserving credit for the major part played in the discovery. Since prospecting was their chief aim, they searched

for further mineral deposits, especially pegmatites. Their knowledge of geology prompted the exploration of an area 400 miles south of their mining holdings, a district quite as remote and, in fact, rather more mountainous (one of the major pre-Cambrian schist belts). The geological makeup of these hills gave promise of their being favorable for the occurrence of large pegmatites, so the two prospectors chose a three-mile stretch of this sixty-mile range for investigation.

Contat, together with Oosthuizen and the latter's enduring wife, then moved into this area. Contat left his partner prospecting there as soon as they had agreed upon a camp where he could locate them on his return. Luck was with them. Within two days Oosthuizen had discovered beryl in large quantities and a sizable deposit of spodumene, a lithium ore much in demand. When Contat rejoined them, they examined the extent of one of the pegmatites with regard to mineral content, strike and association with other rock formations and immediately

discovered the first emeralds. Although the emeralds were of low quality their search was intensified, since they realized that emerald occurred in this area and under these particular conditions. They did not have long to wait. The first strike was made in October 1955, within ten days of their arrival, and they notified the Department of Mines as soon as they could return for this purpose. However, it was seven months before their efforts were finally rewarded. In May, 1957, they struck the second deposit—a significant one this time. It was only a few miles from their earlier operations. Since Contat and Oosthuizen recognized the likely formations, they left extensive areas untouched and concentrated on favorable ground.

Because their first camp was at Sandawana, a small valley, the emeralds discovered were named Sandawana emeralds in commemoration of this. The country is typically Rhodesian, with heavy bush and trees, and is the haunt of numerous game. Crocodiles and bilharzia infest the streams. Before they could set up their headquarters, Oosthuizen had to shoot a large crocodile that looked upon the domain as his private property. Another crocodile has since moved in, but they are leaving it to ward off reporters coming in from that direction. They even feed it with tidbits to encourage it to stay! Unfortunately, in the dry season water is a great problem. This is perhaps one of the reasons why so few have entered this area. It is also inconvenient to approach, since it is forty-five miles from the nearest point of contact with the newly built railway, whereas the only road that could be used means a journey of sixty miles.

The deposit, although rich, is extraordinarily localized. It is evident at the surface and, up to the present, the prospectors have only opened a narrow trench about fifteen feet long and three feet wide. Small sample pits dug in the soil about twenty feet below the deposits show that erosion has been taking place for centuries, since all of the pits appear to contain emeralds, ob-

viously alluvial.

The emeralds were confirmed as such by the Government mineralogist, Mr. A. E. Phaup, of the Geological Survey Office at Gwelo, and the Department of Mines was notified. However, it was only after Contat and Oosthuizen had sent samples worth about \$15,000 (U.S.) to New York that the South Rhodesian Government became really interested in this exciting find. It passed an ordinance in February, 1958, extending control regulations, similar to those in South Africa, for all precious stones in Rhodesia. This started rumors of a diamond find, but by the time the law was made effective on April 25th of this year, it became known that it was emerald that had been found.

Last spring, the writer was asked to investigate the recently discovered emeralds from this deposit. The main purpose was to discover any inherent peculiarities or typical characteristics that would distinguish them from emeralds from other sources.<sup>1</sup> Shortly afterwards, an initial lot of ninety-two Rhodesian emeralds was sent in for detailed study, the results of which are condensed below.

### Geology

Up to the present, only a minimum amount of geological and mineralogical work has been done on the deposits that are yielding emeralds. The deposits are extremely old and were presumably formed at the end of the Shamvian period of granitic activity, which has been dated elsewhere as being about 2,650 million years ago. For comparison, it may be mentioned that the Cambrian period and most of European geology began only 500 million years ago and the Alps were upheaved as late as fifty to eighty million years before the appearance of man, whereas the diamond in most of Africa appears to have its genesis in the Cretaceous age, approximately fifty-one to fifty-eight million years ago. The pegmatites of the Belingwe area might belong to the Bulawayan period of activity, of around 2,800 million years.

Pegmatite dikes are very abundant in both the tremolite schists of the Mweza Range and the gneissic granite contact in the area, although occurring more as scattered bodies without apparent inter-relation. The emeralds have been found associated with the schists in the pegmatite dikes. The majority of the dikes probably belong to the end of the Shamvian System and contain beryl, spodumene, lepidolite, petalite and tantalum-niobium minerals. Particularly, as far as the tremolite schists and the emeralds found therein are concerned, there seems to be some conspicuous similarity to the actinolite schists and their emeralds in the Habachtal, Austria. Recently, chrysoberyl was discovered under conditions similar to the emerald occurrence, in the schists, but nothing final as to its quality has yet been determined.

#### Size

All the emeralds submitted for the present study were small, calibre-cut stones, varying in weight from .15 carat to .38 carat, which is in concurrence with Dan Mayers' statement in the March, 1958, issue of *The Gemmologist* that the bulk of the stones produced are under one-fourth carat in size, although occasionally larger stones may be obtained.<sup>2</sup>

Unfortunately, up to the day of writing, no crystals could be obtained, so that it was impossible to study the morphology of the Sandawana emeralds and the local peculiarities, if any, of their crystal habit.

#### Unrivalled for Color

Small though they may be, these emeralds appear to be characterized by superb quality and unparalleled beauty of color. The hue is of the finest, vivid emerald green with a warm tint of yellow that renders them particularly attractive. Even in these small sizes, the color remains strong and deep, much more uniform and brilliant than the color usually encountered in small-calibre emeralds from other sources. If all Sandawana emeralds are as beautiful as those submitted for this study, they will be unrivalled for richness of color.

#### Chemical Analysis

The chemical analysis led to the following results.

SiO <sub>2</sub>	65%	(67%)
Al <sub>2</sub> O <sub>3</sub>	14.2	(19%)
BeO	13.6	(14%)
Cr <sub>2</sub> O <sub>3</sub>	0.5	
Fe <sub>2</sub> O <sub>3</sub>	0.5	
MgO	3.0	
Na <sub>2</sub> O	2.0	
Li <sub>2</sub> O	0.15	
Total	99%	

It is particularly interesting to note that the emeralds contain a relatively considerable amount of lithium (it was lithium ores, among others, that the prospectors were looking for in that region).

#### Physical Properties

Probably due to the excellent quality of the stones tested, all the physical properties proved to be remarkably constant. A relatively high percentage of chromium admixture, which certainly accounts for the supreme color, finds its expression in high optical properties.

The constants found for  $\omega$  varied from 1.5877 to 1.5949, whereas those for  $\epsilon$  ranged from 1.5806 to 1.5884, giving a frequency average of

$$\omega = 1.593, \epsilon = 1.586, \Delta = .007$$

The birefringence varies between .0069 and .0071. These values were determined on ten cut specimens of excellent quality with the aid of an Abbe-Pulfrich total reflectometer and confirmed on a well-developed crystal prism by means of the method of minimum deviation. Comparison with the refractive indices of emeralds from other sources, as compiled in *Table I*, the Sandawana emeralds rank between those from the Habachtal<sup>3</sup> and those from India.<sup>4</sup>

In keeping with the high optical values, the data for the specific gravity were found

TABLE I

Locality	Refractive Indices			Specific Gravity
	$\omega$	$\epsilon$	$\Delta$	
1. Transvaal	1.593	1.586	.007	2.72 - 2.78
2. Indian	1.593	1.586	.007	2.725 - 2.745
3. Sandawana	1.593	1.586	.007	2.744 - 2.768
4. Habachtal	1.591	1.584	.007	2.72 - 2.76
5. Eidsvold	1.5908	1.5838	.007	2.759
6. Siberian	1.588	1.579	.006/.007	2.72 - 2.74
7. Colombian	1.584	1.569	.005/.006	2.69 - 2.71
8. Brazilian	1.582	1.565	.004/.006	2.67 - 2.70
9. Synthetic	1.566	1.563	.003/.004	2.645 - 2.665

to be also high and rank among the highest known for emeralds. In view of the smallness of the stones under investigation, very careful and precise weighing was made with a semi-automatic Mettler Balance, by immersing the stones in ethylenedibromide. Thanks to the unusual clearness of the specimens, rather constant values could be obtained, varying only between 2.744 and 2.768.

In all of the emeralds tested (with the exception of one, which showed only the 6460 Å line), the absorption spectrum proved to be normal, showing all of the following lines: 6830, 6800, 6620, 6460 and 6370, the two latter ones usually forming the more pronounced borderlines of a weak band.

All of the stones displayed a weak-red residual color through the Chelsea Color Filter, and the dichroic colors are distinct: bluish green for  $\epsilon$  and yellowish to yellow-green for  $\omega$ .

In ultraviolet light of 3650 and 2537 Å, Sandawana emeralds prove to be completely inert, but it is interesting and easy to see how they are considerably more transparent in long waves than in short waves, and, in-

deed, they transmit ultraviolet light only down to 3200 Å, where complete absorption begins with a sharp shadow edge. Here again, Sandawana emeralds fall in line with emeralds from India.<sup>5</sup>

#### Microscopic Examination

It was the aim of this study to investigate whether there were any anomalies or differences of properties compared with emeralds from other deposits.<sup>1,3,4</sup> Although it is gratifying to state that the above-mentioned properties show a satisfactory constancy, it must be admitted that they are not sufficiently distinctive for one to distinguish clearly and without doubt the Sandawana emeralds from others with similarly high constants. Therefore, it is particularly exciting to turn to the nature of inclusions which, especially with emeralds, have again and again proved to be local hallmarks of high distinctive value.

The general aspect to the naked eye or low-power magnification is the well-known picture of emerald "jardin," which disentangles into a host of various inhomogeneities under careful analysis with more powerful magnification. In the uncut crystals found

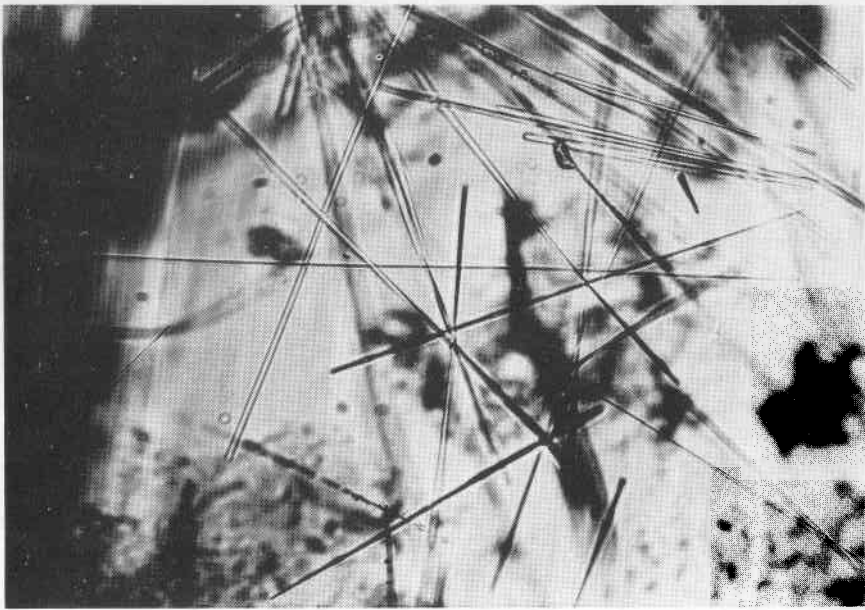
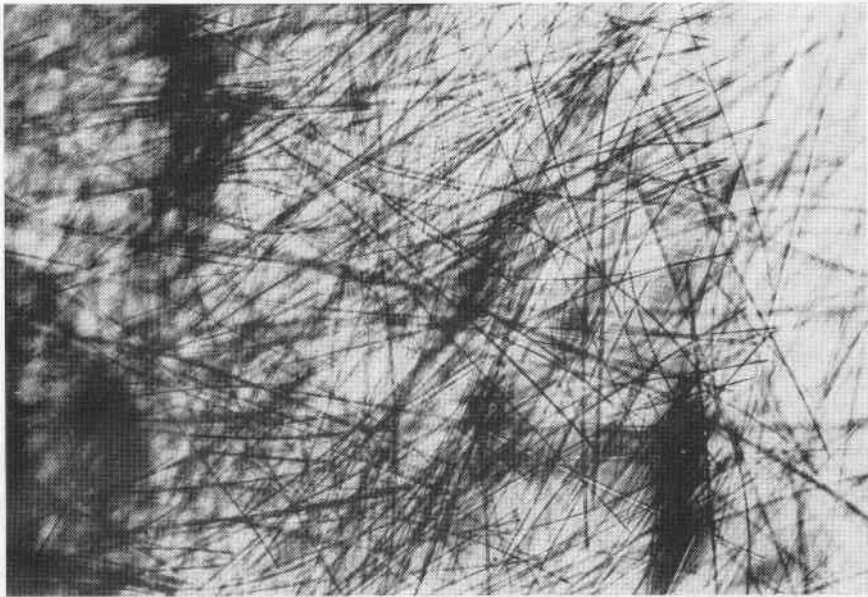


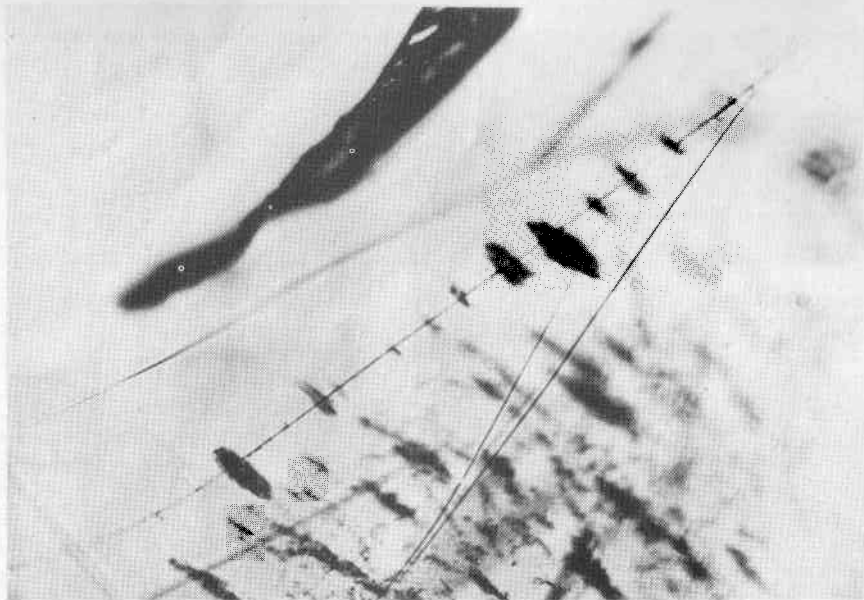
Figure 1. Acicular tremolite rods traversing a Sandawana emerald in various directions.

125x

Figure 2. Thick mass of hair-fine tremolite fibers (some curved).

75x





*Figure 3.* A tremolite fiber running through several diskshaped cleavage fissures. 75x

*Figure 4.* Remarkably short tremolite rods being a typical feature of Sandawana emeralds. 125x





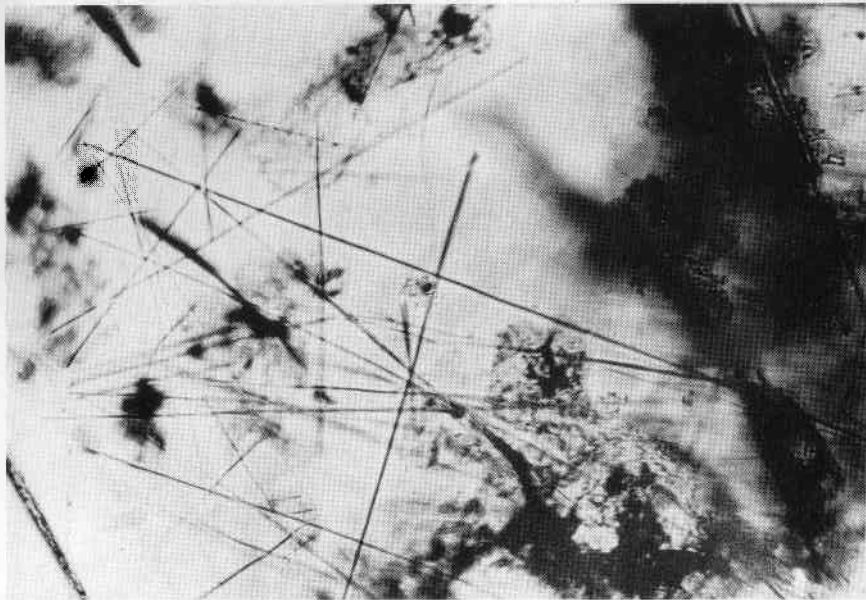
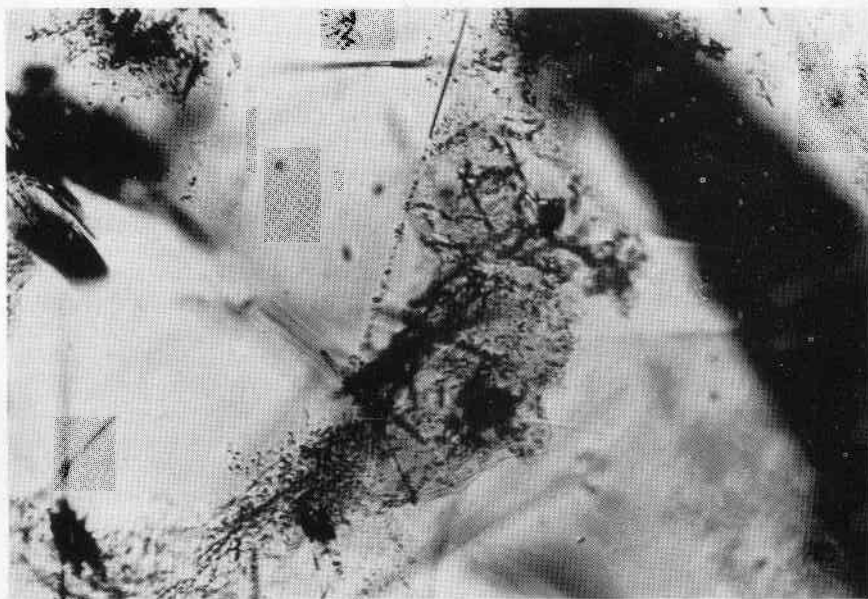


Figure 5. Straight, fine tremolite fibers crossing each other — some of those curious "splashes" which consist of countless ultramicroscopic liquid drops. 75x

Figure 6. Dustlike "splash" forming a brownish halo and surrounding a brown, resorbed garnet crystal. 125x



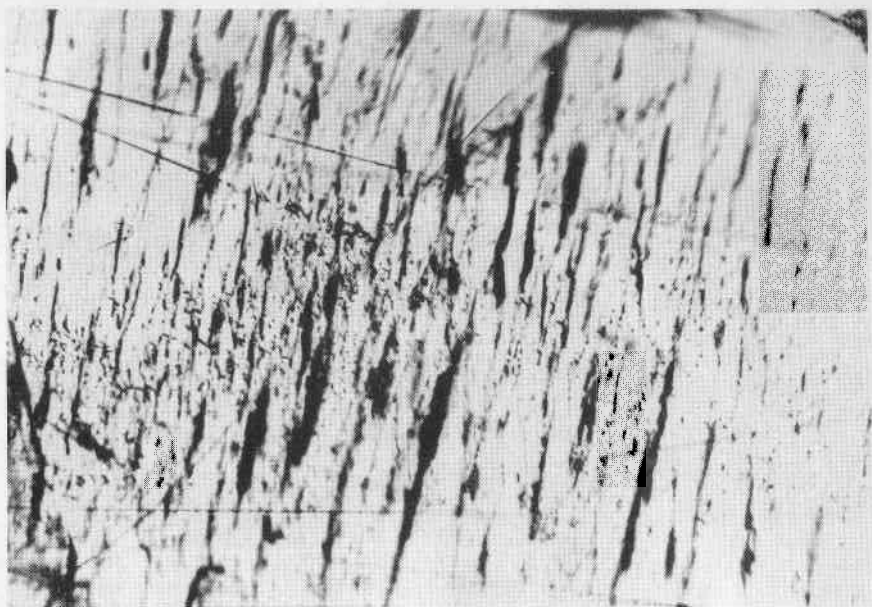


Figure 7. System of parallel shadows being the phenomenological expression of fissures oriented after the basal plane (0001).

75x

on the surface or at a very shallow depth, various shades of brown garnet are very abundant; but since they are usually large, or located in cracks that often reach the crystal surface, most of them would be removed in the cutting.

Limonite seems to be quite common, not only coating the surface of crystals but also filling some of the cracks, and is probably of recent origin. It is limonite that often forms ultrathin films or spangled patches, and is responsible for the brownish coloration of these formations.

Rare inclusions are decomposed plagioclase feldspar, specks of black magnetite and hematite tablets.

The most conspicuous type of inclusions consists of a very acicular mineral, which, in concurrence with the nature of the mother rock, is tremolite, approaching actinolite in composition (Figure 1). These tremolite

needles are either short and appear to be scattered at random in the interior of the emerald, or they form very long, slender fibers that usually are concentrated in dense masses and often traverse the entire gem in irregular directions (Figure 2). They are quite frequently curved, and it appears to be a typical feature that along some individual needles tiny disklike cleavage planes have developed, giving the impression of minute flakes being speared by a tremolite rod (Figure 3).

This type of inclusion picture formed by countless slender tremolite needles is the most characteristic birthmark of Sandawana emeralds, which, although it is quite similar to that of emeralds from the Habachtal,<sup>3</sup> distinguishes Rhodesian emeralds easily from emeralds of any other known locality.

Emeralds from the Habachtal, which were also formed in tremolite schists, are also

characterized by dense masses of tremolite needles. However, here the tremolite needles are much coarser and congregated in denser masses and always occur as long needles, whereas in the Sandawana emeralds the congregations are rarer and the extremely fine, long needles are usually accompanied by short ones (*Figure 4*). Aside from this distinct difference of the interior paragenesis of the two emeralds, the Sandawana emeralds are by far more beautiful, being considerably clearer and of a much more pleasing and vivid color.

Despite the apparent similarity of the inclusions, it will never be difficult to recognize the Sandawana emeralds from those of Habachtal. Further, the occurrence at the Habachtal is much too small and its emeralds of good quality are by far too rare ever to play any role on the gem market. The presence of tremolite needles, however, distinguishes the Sandawana emeralds from emeralds of any other important source.

Besides the mineral inclusions described above, Sandawana emeralds seem to be characterized by some unique inhomogeneities, of which the most frequent ones form some sort of splashes and systems of cleavage fissures. The splashes display a dustlike appearance and they are green or brownish (*Figure 5*). Quite often they form a sort of halo around a brownish, strongly resorbed garnet crystal (*Figure 6*). Their plane seems to prefer orientation parallel to the prism faces. The fissure systems, on the other hand, manifest a pattern of more or less parallel, yet irregular, lines and bands. These lines and bands are cleavage fissures running parallel with the basal plane (*Figure 7*). As far as their existence is concerned, they may be compared to the typical layers of disklike cleavage fissures that are so consistent in Russian emeralds, although the appearance is entirely different in the two members of the emerald family. In the Sandawana minerals the fissures form systems of irregular, interrupted lines and dashes, whereas in Russian emeralds they are ex-

panded swarms of minute disklike fissures arranged in parallel layers.

It is always extremely difficult to adequately describe inclusions, particularly inhomogeneities. The best description can never be substituted for experience gained through personal observation. It is, however, the hope of the writer that the description given above of the typical properties and especially of the characteristic inclusions will make it easy for everyone to recognize Sandawana emeralds and to distinguish them from emeralds of other sources. The reader will have to add his own observations.

### Summary

The physical and optical properties of Sandawana emeralds were investigated and it was found that the values rank among the higher constants for emeralds, closely concurring with those of emeralds from India and from the Habachtal. The phenomenological inclusion-portrait is mainly dominated by the presence of tremolite needles, thus definitely excluding emeralds from India, whereas the individual appearance and arrangement of tremolite needles, as well as the nature of inhomogeneities and especially the superb beauty of the Sandawana emeralds, should prevent confusion with the emeralds from the Habachtal.

The writer is indebted to Mr. A. E. Phaup, of the Geological Survey Office at Gwelo, for his explanation of the geological conditions.

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# A Study of Style and Fashion in Indian Jewelry

By

B. S. MAHAJAN

*Gemologist*

Bombay, India

Since times immemorial India has been known to the world as the land of fabulous gems and jewelry. Emperors and kings possessed gems of rare beauty and size, and ornaments incomparable for intricate design and workmanship. These treasures, though prized as things of beauty, were never underestimated for their investment value. Nothing was so secure as the possession of gems and jewelry, especially in days of war and uncertainty. No wonder, that even the humble common folk appreciated the importance of gold and jewelry as portable wealth. Saving for the "rainy day" took the form of hoarding gold, since it could be converted easily into cash with a minimum percentage of depreciation. The economic aspect has virtually bypassed all other factors in influencing the use and design of jewelry in India.

The immense impact of this tendency on

this country's economy was recently revealed by important statistical data collected on behalf of the Reserve Bank of India. It is estimated that private hoardings of gold in the form of bullion and ornaments amount to Rs. 250 billion (equivalent to \$52.5 billion). Unofficial sources estimate such hoardings somewhere between Rs. 300 and 350 billion. This estimate is substantiated by the following facts:

- 1) the annual turnover of business at the various bullion exchanges amounts to about Rs 2 billion;
- 2) imports of gold in India since the turn of the century amounts to Rs. 15 billion;
- 3) the entire production of the Kolar Goldfields is absorbed by the home market;

- 4) nearly 10,000 tolas (one tola = 11.66 grams) of gold worth approximately Rs. 1 million is being smuggled daily into India by international operators, who make a clear 70% profit on their capital outlay.

Now the Indian Government proposes to utilize these gold reserves to obtain valuable foreign exchange for the Second Five Year Plan. The precious metal used in jewelry is obviously gold.

Tradition and social custom have always stressed the use of gold in making jewelry. The "Streedhan" or the material assets secured by the Hindu woman by way of gift inheritance used to be mainly in the form of gold jewelry. The dowry of the Hindu bride consisted mainly of gold jewelry. The weight of gold used for the ornaments was often the highlight of negotiation between the elders of the marrying couple.

Sentiment and strict adherence to family tradition led to the insistence on making jewelry from one's own materials. And one cannot blame them, for they had their own gold, handed down from one generation to the other. "Old is gold, and old gold is the most precious of all," so runs an old Indian saying. Unfortunately, this factor has imposed serious limitations on the design, manufacture and distribution of jewelry in India.

Creation of original designs and new interpretations of traditional motifs did not receive much encouragement during the British regime. The lack of enthusiasm on the part of the rulers was obvious, because they could import their requirements from the United Kingdom and Europe. The contention that Indians did not desire anything new was clearly based on the taboos and orthodox opinion prevalent in India. Research in consumer needs and their interpretation in the form of new designs and products has never been possible for want of desire to own mass-produced merchandise.

Large-scale production of gold jewelry,

either complete or in the form of blanks and findings, still remains unaccomplished, because there are no federal laws to control the quality of precious metals. Every manufacturing jeweler seems to have his own quality standards. Quality control has been possible only in the case of silverware manufactured by large factories. Mass production implies prior demand, and demand can be created by good advertising. In the U.S. and elsewhere the merchandise is presold by means of aggressive national advertising through the media of newspapers and television. India cannot as yet boast of her television. With only 15 percent literacy in India, newspaper advertising is futile. The complexity of the language problem has made newspaper advertising almost beyond the reach of the average jeweler. (In Bombay alone we have English, Hindi, Marathi, Gujarati and Urdu language newspapers; and a salesman may be required to use, in addition to the above, Kannad, Sindhi and occasionally French or German.) National advertising seems to be a thing of the remote future. Most important of all, the capital resources of the average jeweler are not adequate either for mass production or for effective advertising.

Lack of standardization regarding the quality of precious metals has ultimately led to the absence of quality standards for workmanship. The cost of making individual pieces of jewelry depends on the quality of the precious metal used and workmanship. Since most people have their own gold to use, their ultimate aim is to find someone who can make the jewelry at the lowest possible price. Since competitive price is possible only at the expense of quality, the workmanship is generally poor. The customer demands low cost, which the dealer provides by paying the worker the lowest wages, and the worker in turn gives the lowest quality of workmanship. This vicious circle cannot be broken. The professional "goldtester" makes money by charging a 1/4 per cent *ad valorem* fee for supposedly test-

ing the quality of gold, and receives at the same time a monthly salary from the jewelers who direct their customers to him. In fact, the professional goldtester helps to perpetuate the vicious circle.

The panacea for the ills listed above happens to be the introduction of compulsory hallmarking of jewelry made of precious metals. Compulsory hallmarking will ultimately necessitate mass production of not only blanks and findings but of complete pieces of jewelry also. Since consumer research and creative designing are the prerequisites of mass production, industrial designing will receive great impetus. Quality of workmanship can be more easily controlled in mass production than otherwise. The Indian Government has been carefully studying the implications of federal law concerning the hallmarking of precious metals. Considering the magnitude of the problem — breaking the age-old tendency to use one's own materials, especially gold, and educating the people to accept quality standards — the legislation has to be effected with caution. However, the day is not far off, since we have already introduced decimal coinage (April, 1957) and will shortly accept metric standards (October, 1958). The forthcoming legislation will effect a radical change in the fashioning and marketing of jewelry in India. In the future, made-to-order work will pertain to customer's gemstones rather than to gold.

The use of gemstones in jewelry, although widespread since ancient times, has always been limited to only a few. The earliest mention of gemstones in the post-Vedic literature, notably the *Bhagvata* (circa 2300 B.C.), refers to *Padmaraga*, or the ruby. The Lord sayeth of Himself, "I am the ruby among gems." Each era had a special gemstone ascribed to it. The first era, called the *Treta-yuga*, has the ruby. The *Dwapara-yuga* and the *Kali-yuga* (which is current) both have the diamond. The origin of the conception of *Nava-ratnas* seems to be of a later origin. *Nava-ratnas* are the nine gem-

stones considered affiliated with the nine major planets. These are stated as follows: sun—ruby; moon—pearl; Mars—coral; Mercury—emerald; Jupiter—yellow sapphire; Venus—diamond; Saturn—sapphire; Rahu—hessonite garnet; Ketu—chrysoberyl cat's-eye. (The last two are known as *Dragon-head* and *Dragon-tail*, respectively.)

Of the above nine gems, diamond, ruby, emerald and pearl have been the most favored in Indian jewelry. Surprisingly enough, Indians knew about other gemstones as well. This is clearly evident from the Sanskrit synonyms for the many gemstones that are used in modern European jewelry. The distinguishing characteristics of gemstones happen to be the subject of many a treatise on *Ratna-sastra*. For example, zircon is called *vajrabhaseeya*, which literally means one that simulates a diamond. Besides, India did have access to most of these gemstones. And this condition lasted until the breaking up of the Indian Empire, which included India, Afghanistan, Burma and Ceylon. Diamond, ruby, emerald and pearl were in one sense birthstones; yet, all of them could be generally used in jewelry. The rest of the *Nava-ratnas* (namely, yellow sapphire, sapphire, chrysoberyl cat's-eye, hessonite garnet and coral) did not find favor in jewelry. Serious limitations have been imposed on wearing sapphire, because it has been considered to bring more harm than good. Coral beads have been mainly used for rosaries. Superstition and certain taboos have definitely narrowed the scope of gemstones in Indian jewelry. Like the diamond-sapphire combination in the United Kingdom and Europe, pearl-ruby and diamond-emerald are the more popular combinations in India. The use of other gemstones pertains to *Nava-ratna* rings, earstuds, pendants, etc., only. Strangely enough, gemstones of all kinds were mined, faceted and exported from India in the past. It is indeed a pity that not many could be used in jewelry.

It has already been emphasized that jewelry was specially made on two important

occasions in the family, birth and marriage, and sometimes on anniversaries. The design of jewelry made for such occasions served the purpose of the occasion. The christening ceremony of the Hindu child occasioned the piercing of ears; even the male child was no exception. The gold ornaments either specially made for the occasion or received as gifts consisted usually of thin gold bangles and pairs of gold sleeper earrings. As the girl grew up she simulated her mother in most matters. Sometimes she wore her mother's jewelry when she did not have anything of her own. Occasionally, a piece of jewelry was made when her parents could afford it. Major items of jewelry were made only at the time of marriage. Perhaps that was the right occasion when her parents could really make up for the economies of the past years. The jewelry was necessarily made for an occasion rather than to suit her individuality. Perhaps the only heartening note concerned her bridal costume. The yellow *sari* went well with ornaments of yellow gold. Very few indeed realized the importance and application of the accent-harmony theory of modern times. It must also be remembered that the woman had very little freedom to choose in matters of jewelry. Further, she was hopelessly dependent in economic matters.

In spite of the ignorance concerning the accent-harmony theory as advocated today, Indian women show remarkable consciousness of the fundamentals of color harmony. Dark-complexioned women from South India wear glittering diamonds, synthetic white sapphires and synthetic rubies. Fair-skinned women from the North prefer solid yellow gold. However, they have never tried other means of adornment, particularly colored stones. In fact, the immense possibilities of color combinations have never been previously explored. Even the jewelers missed the enlightened approach; the customers heard still less of it.

However, the modern Indian woman is quickly becoming aware of the applications

of the color-accent theory. She is learning to dress correctly, wear different hair styles, and to adopt Western clothes. The make-up is still something for the larger cities. The revolution is due to two important factors: one, the impact of Western ideas, education and way of life; two, economic independence. Films and fashion magazines are perhaps the best propagators of ideas and way of life. Westernized young women of today seem to appreciate the "Audrey Hepburn look" in dress and demeanor. The "high fashion" from the European continent is rather remote from the heart of the Indian woman. The American way of life, as portrayed by pictorial magazines, has considerably influenced the younger generation, especially in the larger cities. Dating, courtship and engagement, which were at one time unthinkable, are evidently the result of the impact of Western thought and way of life. Greater economic freedom for the young educated woman has helped her to enjoy the small luxuries that have been denied to her, and these luxuries include items that help to add to her personality. Now she can afford to experiment freely in matters concerning the application of the accent-harmony theory.

The impact of fashion in dress and jewelry, as evolved by film stars, has been equally important. However, I personally feel that the selection of jewelry by the Indian film stars is hardly judicious. Unfortunately enough, they have yet to meet an enlightened jeweler who will guide them properly in their selection of jewelry.

Recent revival of traditional fashions in jewelry has adversely affected the design in contemporary Indian jewelry. A curious and sometimes not-too-wise blending of the traditional Indian with the modern Western has resulted in ugly and ridiculous forms. Such forms are utterly unsuitable with reference to the color-accent theory. A glaring example of such a hybrid form is a combination of the chandelier-type Western with the pendant-type Moghul *jhumkas* (earrings).

The foregoing paragraphs form the background for a detailed study of the style and fashion in contemporary Indian jewelry.

Before attempting the study of style and fashion in jewelry proper, a brief introduction to the dress of the Indian woman becomes necessary. It may be remembered that there is a great diversity in the social and cultural backgrounds of the people of India. Similarly, the costumes are extremely divergent, ranging from the shortest *sari* to the overflowing *kameez-salwar*. However, the *sari* with a length ranging from five to nine yards may be considered as the standard costume for women in India. It is somewhat intriguing for the foreign visitor to observe the flowing lines of the Indian *sari*, which is draped round the body without the help of a belt or similar contrivance. It is interesting to note that the *sari* is draped in no less than ten different ways in different parts of India. The normal way (i.e., draping the *palav*, or the visible end of the *sari*, round the right shoulder) is considered in this study. The *choli*, or the blouse, comes in wide varieties, too. They range from plunging necklines and décolletés and bare midriffs to high and close-collared (and strictly moral, too) protective ones! In fact, one has to consider any of these combinations with reference to the form and color of jewelry and gemstones.

No great distinction is made between the dress for the day and that for the evening, except perhaps for texture and color. Unlike their rigid black of the evening-wear in the Western hemisphere, the Indian woman has a far greater freedom to choose the color. Her choice regarding the *sari* may range from the subtle shades of different colors to a flaming display of the various hues. Further, there are not many hard-and-fast rules regarding the texture of *saris* to be worn at different times of the day. Finer fabrics may be used during the daytime, owing to the tropical climate. Handspun and handwoven *saris* happen to be the equivalent of office or daytime wear made of

tweedy fabrics. In this connection, it may be remembered that engraved gems and cabochons, which otherwise accent such fabrics, are not much favored in India. Such fabrics, however, offer sharp contrasts to diamonds and other brilliant gems.

Hats, scarves and other accessories, which form a part of the dress ensemble of Western women, are totally absent in India. These factors, therefore, are not necessary for our study of style and fashion in jewelry.

The color of hair is also limited to one: dark. There are neither blondes, redheads nor brunettes, in the real sense. Nevertheless, the tendency to dye the hair to subtle shades by means of hydrogen peroxide is increasing. Faint traces of natural brown hair on a dark head are sometimes encountered. Yellow gems, which find favor with blondes and brunettes, are generally abhorred in India.

Nothing keeps the beauty-conscious lady at her dressing table longer than the styling of her hair. The hair, which is usually long, is worn in many ways; in fact, the hairdo can be changed as often as she desires. Besides the traditional hair styles, much experimentation is being carried out in the film industry. In addition to the practice of having flowers in the hairdos, Indian women wear quite a few ornaments in the hair. However, there is hardly anything that approaches the jeweled comb. Many of these ornaments are used in conjunction with long, massive, chandelier-type earrings. The *tika*, or *bindi*, is worn in the parting of the hair. The end part of the ornament is usually a jeweled star or moon and hangs freely on the forehead. Although worn occasionally, this ornament can minimize the breadth of the forehead. Other equally useful means used for this purpose is the *kumkum*, or the vermilion mark on the forehead of the Hindu woman. The *kumkum* can be worn in such a manner as to minimize the effect of a too broad or too narrow forehead. The forehead is sometimes painted.

The ideal shape of the face, oval seems



to have won universal approval. *Chandramukhi*, or the moon-faced one, happens to be one of the connotations in describing the heroine of many a romantic tale. What the jeweler can do for the lady who does not have ideal features forms the matter of discussion in the following paragraphs.

Robert Crowningshield, Director of the Gem Trade Laboratory of the Gemological Institute of America in New York City, is perhaps the first gemologist who has enunciated a theory regarding the application of the color-accent-harmony in the sphere of gemstones and jewelry. His paper on *Costuming and the Sale of Colored-Stone Jewelry* (GEMS & GEMOLOGY, Summer, 1953) is a valuable contribution to gemology. Since the publication of this paper, I have been experimenting on the line suggested by Crowningshield. My customers have been the "guinea pigs" in these experiments. The application of the theory necessitated a few modifications to suit Indian conditions. Nevertheless, the study of the theory has given me an insight into, and greater understanding of, the problem confronting almost every conscientious jeweler. An analysis of the theory with special reference to Indian conditions appears below.

Of all the features the face is the most important; therefore, what the jewelry does for the face assumes great importance. There are many items of jewelry that can accentuate the best features and help to minimize the effect of not-so-well proportioned ones. I will consider them one by one.

### Necklaces

The choker-type necklace broadens the face and adds fullness to the face, therefore, it is ideal for a thin face and neck. At present, the choker is in vogue in India. Most of the designs are borrowed from old Moghul and Rajput ornaments. A mixture of both the Moghul and the Rajput styles is found in the ornaments of *Saurashtra* (Western India); these have influenced the design of the choker to a great extent. Ornaments

of the hill tribes and the aborigines have inspired many a pattern in this category. Most of the current designs are made from dies, in order to reduce labor costs; however, in smaller towns they are entirely handmade. The influence of asymmetrical designs from the West is noticeable in the designs current in large cities. The moderately short necklace, which accentuates the oval facial outline, is usually a combination of handwork: beads and domes and some pieces that may be diestamped. The designer has a far greater scope in this respect. The *mangalsutra*, which is worn by married Hindu women, consists of black glass beads strung on gold wire and with knots in between; this is usually worn long and in two or three strands. Multistrand necklaces are generally known as *bars* (literally, garlands). The motif for the design usually determines the name of this ornament; for example, a necklace with a Bakula-flower motif is called a *Bakulahar*. Besides such gold necklaces, stringed beads of a number of gemstones serve equally to add to the apparent length of the neck. Apart from the necklace, countless combinations and effects are possible with the chain-pendant theme.

### Ear Ornaments

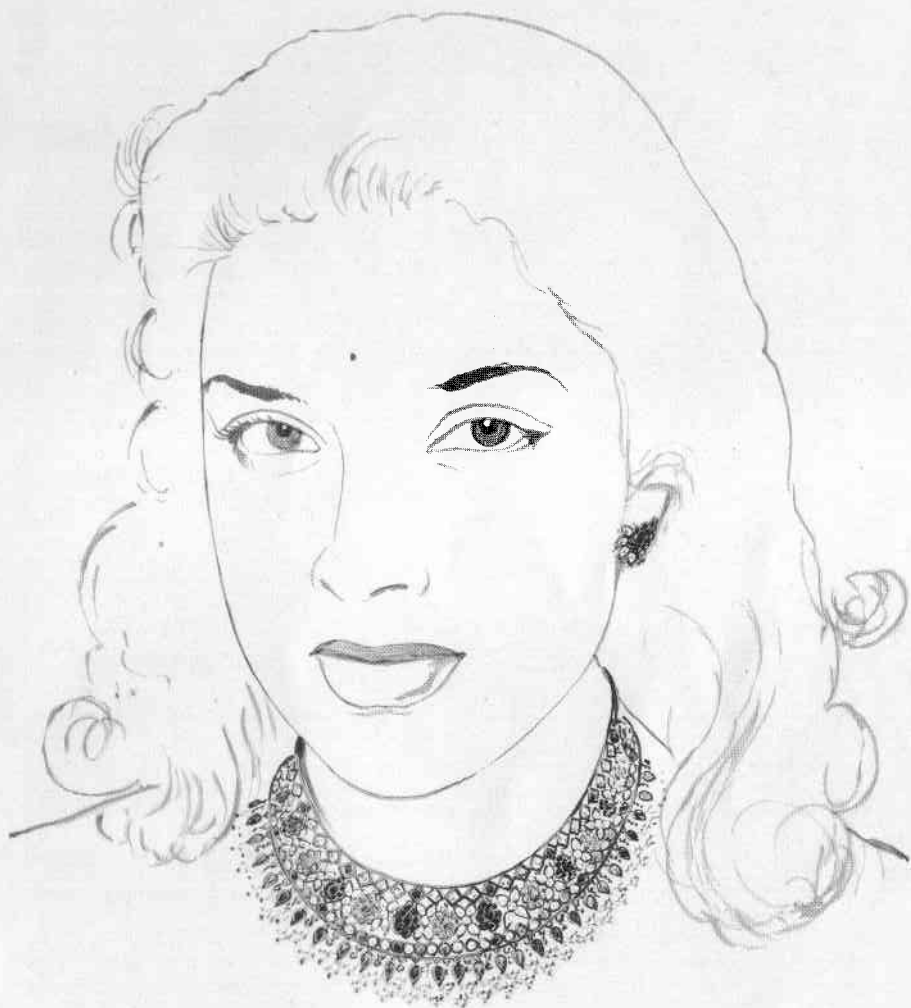
These are found in the form of studs, clips and rings. There has been a revival of the fashion for earrings since Queen Elizabeth II was crowned. The delicate form of the earrings of the Victorian era is no more; neither is the profusion of colored stones, especially amethyst and garnet. The present form of the earring in India originates in the ancient Moghul *jhumkas*, rather than in the Victorian earring. It is interesting to note that such *jhumkas* were always massive, because they were definitely meant for pierced ears, the weight being of no great consideration. Further, in case of really heavy earrings, the weight was easily counterbalanced by means of chains that could be tied to the ornament in the hair. The

(continued on page 219)



The design of the necklace and the earrings is typically Moghul. The floral motif and exuberance of color are characteristic of the Moghul type. Long pendant-type earrings have made her face look longish, thus accentuating her narrow chin. A too-broad choker has unnecessarily added to the already full neck.

*Photos courtesy India's "Filmfare" magazine, a Times of India publication.*



The corrected design is a suitable amendment of the original design.

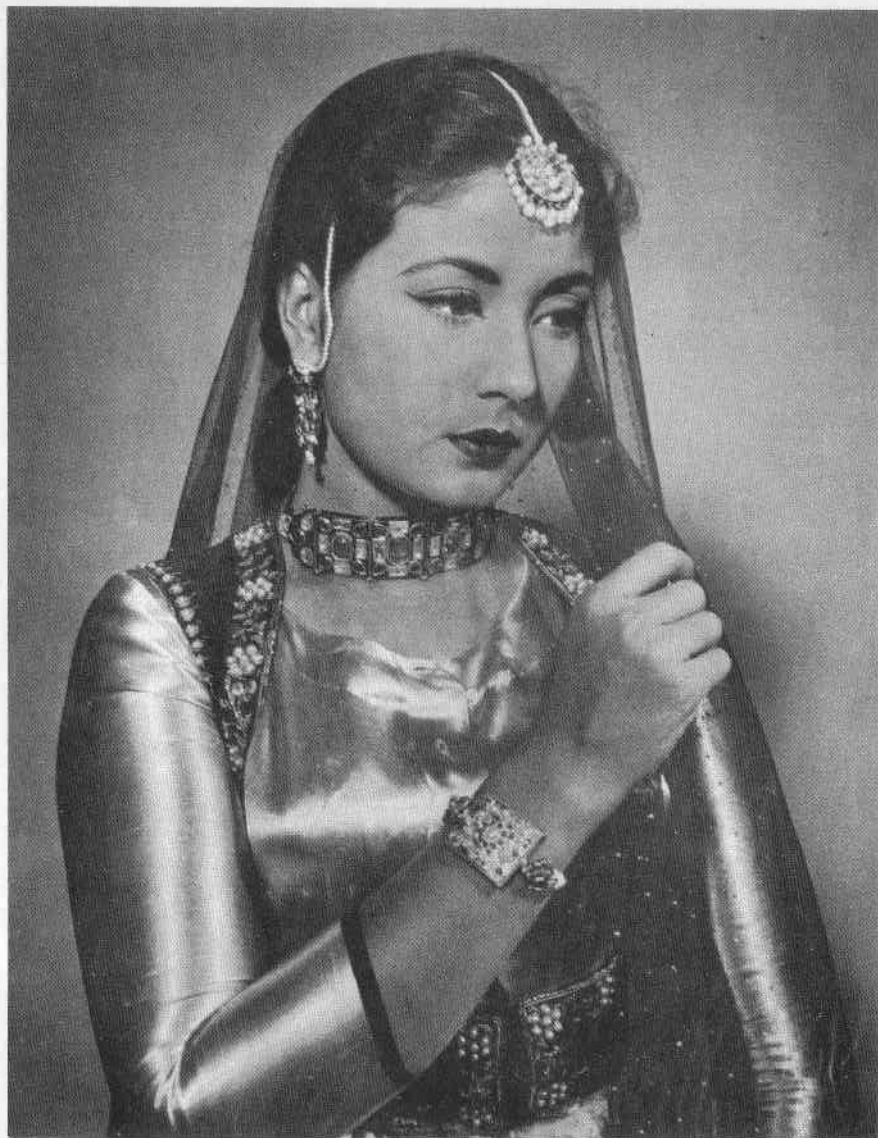
*Corrected designs courtesy of Ramnath Powle, designer for Bala Appaji and Son, Bombay.*



The design of the necklace and the earrings is typically Moghul, both of which are set with pearls, rubies and sapphires. The apparently heavy *jhumkas* are counter-balanced by pearl chains attached to the hairdo. A too-broad choker and massive *jhumkas* have unnecessarily added to the fullness of the face. The *jhumkas* make the otherwise slim features plump.



The corrected design accentuates the softness of the eyes and the chinline.



The model is wearing a complete Moghul outfit. In addition to the normal necklace, bracelet and the earrings, she is wearing a *tika* on her forehead. The collar and the bracelet are made of enameled gold plate and encrusted with rose-cut diamonds, rubies and emeralds. The back portion of the collar is golden and white silk tassel. The earrings are too delicate in comparison to the collar and the bracelet. The standing collar does not suit this lady. The *tika* is perhaps the only redeeming item in the ensemble.



The corrected design has the choker moderately short. The earrings and the *tika* are matched. Four jeweled bangles instead of the bracelet make the wrist appear slimmer.



This is an example of a Western costume, with ill-assorted items of jewelry. The two-row pearl necklet is too tight; it makes the neck appear plump. The chandelier-type earrings add width to the face as well as length. The face appears almost rectangular.





**A moderately long necklet and earrings in the corrected design make the face more animate.**



The model is wearing a pendant necklace with diamonds, rubies and agates. Everything is fine except the earrings with the "grapes" motif. She should wear small earclips.

The model is wearing a gold enameled ensemble that is complimentary.





The model appears in the traditional Punjabi bridal outfit. Note the *panja* that covers her palm.

modern massive earrings made of anodized aluminum and for unpierced ears cannot be duplicated in real gold, because they are too heavy for modern use. The earclip in India is certainly the result of Western influence; the earstud, on the other hand, is typically Indian. The button- or cluster-type earring, when set with stones, is generally favored in India owing to the utter simplicity of form. The cluster type is known as *kuda*, and is almost a permanent fixture in the ears of women from the South and the West. The most favored gemstones for this form are diamond, ruby and pearl, along with

their substitutes. Such earstuds are used obviously without any discrimination; it is rather difficult to persuade a woman to use this type with caution and discretion. The sleeper earring comes in a number of forms: plain, engraved and elaborate ones; it is known as *bali*. The massive and elaborate type known as the "fisherwoman's earring" is in current vogue, especially favored by rich and fashion-conscious women in Bombay. However, indiscriminate wearing of such earrings is simply atrocious. Further, there are some forms that do not fit into this category at all; they may be called orna-

ments for the ear. It is not surprising to find one that completely covers the entire ear. Generally speaking, any form of ear ornament increases the apparent width of the face; therefore, it is necessary that they be worn with great caution. How much long earrings affect the shoulder outline is not yet known, since bare shoulders are still a rarity.

#### Nose Rings

A small yet not unimportant item of jewelry—the *nath*, *chamki*, or the nose ring—is typically Indian. The left nostril is usually pierced for this purpose. How much this ornament adds to the personality of the wearer is still a matter of conjecture. Nevertheless, I consider it as one of the most effective means of adding a touch of glamor to certain faces.

#### Sari Pins

A sari pin is more common than the brooch or clip. Here the scope for the designer is limited. With the introduction of brocaded and applique *saris*, lapel brooches with typically Indian motifs are in demand. A pin, brooch or clip can help to slenderize the appearance of a woman. The waistline appears narrower when the *kamar-patta*, or the belt, is used. This ornament is not used nowadays, except on certain occasions. It is a traditional favorite of Maharashtrian women.

#### Bangles

Like the *kumkum*, bangles are worn only by maidens and married women; they are made of glass, ivory, silver and gold. Recent substitutes for glass are plastics and bakelite. Thin bangles, as well as *patlis* (small bracelets made of diestamped plate) and *kadas* (broad bracelets either beaded and faceted or with filigree), are the traditional ornaments for the wrist. The *vak*, which is worn on the upper arm, is a typically Maharashtrian ornament. No other country can boast of such a galaxy of ornaments for the wrist. Both bangles and bracelets can

be advantageously worn by any woman.

#### Rings

Except perhaps the cluster-type ring, India has borrowed to a considerable extent from the West, insofar as ring design is concerned. Scant attention has been paid to the problem of suiting the ring to the wearer's personality. Rings are worn rather indiscriminately, the selection of shape and design not being judicious. The *panja* is a classic example of fashion in rings. Each finger has a ring on it, and the rings are fastened to the bracelet by means of thin chains, thus covering the entire back of the hand. The *panja* is utterly unsuitable for daily use.

The extent to which fashion fits into the style and with what results is graphically illustrated in the following pages. Film stars are supposed to possess better-than-average features. Photographs of some Indian film stars wearing jewelry have been selected from a film magazine called *Film Fare*. In my opinion, the jewelry worn by them does not enhance their personalities. Constructive criticism is offered by means of corrected designs that appear side by side with the original ones. A comparison of both of these will prove the lack of awareness of the accent-harmony theory, even among film stars. No wonder that the common folk have not been able to appreciate the significance of the theory. Style-consciousness is evident in matters of dress and its accessories. The credit is certainly due to the makers of fabrics and dresses, who achieve results by consistent educational advertising on a national basis. The jewelry industry has failed to do this.

However, I am not pessimistic about the future of the industry in general and the design in jewelry in particular. To my mind, the apparently hybrid designs are characteristic of a period of transition. Soon a time will come when we will have evolved our own designs and fashions that can be truly called Indian.

# Sandawana Emeralds

## Some Commercial Aspects

By

DAN E. MAYERS, M.Sc.

*Managing Director, Sandawana Emeralds*

Almost everyone interested in precious stones has at some time wondered, "Supposing I were to find a brand new mine of emeralds, rubies or sapphires. What would I do with them?" This article offers one possible answer.

The discoverers of the Sandawana emerald deposit, Messrs. L. J. Contat and C. J. Oosthuizen, displayed a restraint both unique and exemplary. They kept their secret for eighteen months, while trying to formulate some idea of the value of their discovery. They proceeded with their normal business (which is the production of rare ores, such as columbite, beryl, chromite, etc.) as if nothing had happened. Actually, they were not at all sure that anything had happened, since the gem dealers to whom they sent samples of the rough emerald rejected it as worthless; the rough looks most unpromising.

Among the recipients of samples was Crystals S.A., who forwarded them to Eldot & Company, the prominent New York lapi-

daries and gem dealers. Eldot & Company cut the samples and found to everyone's delight that the yield, although only amounting to a few percent of the weight of the rough, was of superb quality; a quality, as brought out by Dr. Gubelin in his article, that is entirely unique.

There followed correspondence, additional samples, and a trip to Africa to discuss the matter with the thoroughly bemused discoverers and the hardly less bemused Government.

In the first place, it was felt essential to avoid confusion between the Rhodesian emeralds and those of South Africa. Quite apart from the natural pride of Rhodesia in the discovery, and their desire that it be recognized as distinctively Rhodesian, it was vital from a commercial standpoint that no such confusion should occur. There is as much difference between the Rhodesian emeralds and emeralds from South Africa as there is between rubies from Burma and rubies from Siam.

It was necessary to choose a distinctive name for the emeralds—a name pleasant to the ear, easily pronounced, and easily remembered. Dr. Gubelin, who was requested to advise the discoverers in gemological matters, suggested that the name should, if possible, be geographic. Accordingly, the stone was named after the Sandawana Valley, in which the discoverers camped just prior to making their find. Since the name Sandawana refers also to a mythical small African animal believed by the natives to bring good luck, it seemed a particularly happy choice. The speed with which it has been accepted by the trade and by the press seems to justify the decision.

Secondly, it was recognized that the world suffers from an acute shortage of fine, small-sized emeralds, and the Sandawana deposit produces only small sizes. As a result of this shortage, the manufacturer of jewelry employing fine emerald calibre has greatly declined. Available stones were either too pale or else dark, black spotted and unattractive, so the jeweler preferred to use the more readily obtainable rubies and sapphires. To counteract this tendency, it was decided that stocks of Sandawana emerald calibre would be established in the leading gem centers of New York, London and Paris, with Eldot & Company of New York being the deserved first recipient of such stocks.

One unmistakable lesson to be drawn from recent experience is the enthusiasm of the public for emeralds and the common neglect of this demand by the jeweler. This is not surprising, since there is no emerald dealer to whom the jeweler can turn, as he can in the case of diamonds, with the certainty that a stone will be promptly forthcoming that will meet his customer's requirements. Insofar as small stones are concerned, it is hoped that the establishment of these stocks of Sandawana emeralds will assure jewelers that they can obtain emeralds with the ease and confidence to which they are accustomed when seeking diamonds. Of course, this can not be accomplished over-

night. The cutting of the stones is difficult and arduous, due to the fractured nature of the rough and the small size of the resulting stones. However, a start has been made, and future progress will be steady.

Thirdly, it was felt necessary to set some policy regarding the sale of Sandawana emeralds in the rough. On the one hand, it was recognized that the integrity and uniqueness of the Sandawana emerald could only be preserved through the controlled sale of cut stones. If sold only in the rough, it would soon fall into anonymity and would, as certain dealers have seriously suggested, be sold as exceptionally fine Colombian calibre. This is reminiscent of the days when South African diamonds were sent to Brazil to be legitimized, and of the still earlier days when Brazilian diamonds were sent to India for the same purpose. It was the desire of both the discoverers and the Government to avoid such foolishness.

On the other hand, it was recognized that the American and European cutting capacity for such small stones was limited, and also that small stones could be cut more economically by Oriental labor. The problem of appraising the rough material prior to sale was also a difficult one, since the clear spots that produce good-quality stones are almost invisible in the rough.

The solution adopted consisted in taking a fair sample of all lots of rough and having them cut in Europe and America. On the basis of this cutting, a fair appraisal of the value of the rough was possible and served as a basis for setting the prices. The procedure also assures buyers of the rough that the lots have not been picked over, since such a procedure would make the cutting results useless for appraisal purposes.

Fourthly, it was recognized that distribution of the Sandawana emeralds should take place through a single channel that would be sensitive to market conditions and that would avoid any action that might injure market confidence; this is particularly vital, should the deposit be an important one. It

should be clearly stated that, at the present time (midsummer, 1958), there is still no precise knowledge as to its size, which is entirely in the realm of speculation.

With all of these considerations in mind, a corporation, Sandawana Emeralds S.A., was formed to act as exclusive world distributor of the stones, both rough and cut. Policy for the company is set by the discoverers, in consultation with the Precious Stones Board of Southern Rhodesia.

It is hoped that the above information will give some insight into a problem that, perforce, arises but rarely. In achieving the solution, it was most fortunate that the discoverers were intelligent, patient and unex-

citible and that the Government of Southern Rhodesia went to great trouble to achieve an understanding of the problems involved with a view to cooperating in their solution.

Of course, many problems of a minor nature remain. For example, Colombian emeralds are being offered as Sandawana emeralds, proving once again that imitation is the sincerest form of flattery. Fortunately, as Dr. Gubelin so expertly points out, there need be no reasons for confusion.

The Sandawana emerald has already assumed a recognized place beside the finest products of Colombia in terms of quality. Its ultimate position in the trade will depend on the development of the mine.

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### ABOUT THE AUTHOR



B. S. Mahajan, gemologist-jeweler, Bombay, India, is the managing partner in the family-owned jewelry firm, Bala Appaji & Son, Bombay. His experience in the jewelry trade began in 1943, when he started on a part-time basis to learn its various phases. In 1947 he assumed a full-time participation in the firm, becoming manager of buying, selling, workshop supervision and administration. He is a graduate of Elphinstone College, Bombay, and received his M.A. from the University of Bombay. Mahajan became a Fellow of the Gemmological Association of Great Britain, including laboratory training at Chelsea Polytechnic in London (1954). In 1955, he enrolled in the entire GIA curriculum, earning his Gemologist Diploma this year. Other activities include memberships in the Indian Merchants'

Chamber, the Bombay Diamond and Pearl Merchants' Associations, and the Indian Conference of Social Work. Hobbies include literature, the fine arts and music. He is vitally interested in the social problems of India and has studied at the University School of Economics and Sociology. His interest in the style and fashion of jewelry in India prompted the writing of the article, *A Study of Style and Fashion in Indian Jewelry*, which appears on page 202 of this issue of GEMS & GEMOLOGY. It was submitted to the GIA as his thesis in partial fulfillment of the requirements for the Gemologist Diploma.