

A G A

PUBLICATION

AN INTERNATIONAL NEWSLETTER

VOLUME SIX, NUMBER FIVE
NOVEMBER 1981

Executive Editor Joseph W. Tenhagen, F.G.A., G.G.
Editor Holly E. Yates

Board of Directors:

President Joseph W. Tenhagen, F.G.A., G.G.
Vice President Marvin D. Miller, G.G., P.G.
Secretary Tomiko Butler, F.G.A., P.G.
Treasurer Masano Hidaka, F.G.A., P.G.

ACCREDITED GEMOLOGISTS ASSOCIATION 

36 N.E. 1st Street, Suite 419
Miami, Florida 33132
Phone: (305) 374-2411

*TO DEVELOP AND PROMOTE PROFESSIONAL STANDARDS
IN THE PRACTICE OF GEMOLOGY*

Emerald Prospecting in Rhodesia

R. Mackenzie, F.G.A., G.G.
Johannesburg, South Africa

During 1976, while operating as a consulting geologist in Rhodesia, I carried out prospecting operations for emerald and examined a number of emerald mines. These notes are based on this work, and on information from a number of Geological Survey Bulletins.

Geology

Most emerald deposits in Rhodesia occur where pegmatite veins intrude ultrabasic rocks of the Basement Complex such as serpentinite. The ultrabasics are altered metasomatically to phlogopite or tremolite schist in the vicinity of the pegmatite. Beryl is usually present in the pegmatite: as ordinary beryl in the core, and as green beryl or poor quality emerald near the contact with the schist.

The emerald in the schist appears to be the result of the migration of gasses from the pegmatite during metasomatism, the chromium necessary for the green colour being present in the ultrabasic rock.

The number of emeralds decreases away from the contact with the pegmatite. Concentrations of emerald are often associated with structural traps such as folds. Emerald crystals often show zonal growth rings with varying depths of green related, presumably, to varying chrome content. Most of the emeralds found in phlogopite schists tended to be inferior in colour to those found in tremolite schists.

Existing Mines

Mostly defunct mines in the southern part of Rhodesia were visited: Sabtri, Mustard, Pepper, Mayfield, Chikwanda, Verlos and Novello. These had generally been worked open-cast to a relatively shallow depth. In most instances, workings were abandoned when hard rock was encountered. Sandawana is the only mine in Rhodesia which has been worked underground to any significant extent. This suggests that emerald deposits might prove viable to greater depths in areas of higher rainfall where more weathering has taken place.

Prospecting

Faulting, with which pegmatites are often associated, and ultrabasic rocks can generally be readily located on aerial photographs. In areas of deep overburden, anomalous nickel values in soil samples indicate ultrabasics.

In one deposit, (Popotekwe Claims on Brentwood Farm, 11 miles northeast of Fort Victoria) the following procedure was adopted:

1. Pits, usually 1-2 metres deep, were dug to bedrock on a 5 metre grid. Some phlogopite schist and pegmatite were found.
2. Trenches at 10 metre intervals were dug across the strike, where showings of pegmatite and ultrabasics had been found in the pits.
3. Further excavations along the strike defined an emerald-bearing zone with a strike of 40 metres and an average width of 3 metres which dipped at a shallow angle to the south.
4. Bulk sampling, or trial mining, was carried out for a period of one month. Forty-three tons of ore were washed on a small vibrating screen. This yielded 12 kilograms of beryl, of which 2 kilograms were emerald. Sixty-five carats were cut from selected crystals, and of this, 15 carats were classed as reject. The remaining 50 carats were valued at \$7,000. The largest stone cut weighed 2.3 carats; the smallest, 0.1 carat.

Very few emeralds were found during mining. Generally, they only appeared in the washed ore. While mining was in progress, I was visited by a group of officials from the Ministry of Mines. They expressed concern at the absence of a security fence, which they felt would prevent theft. I invited them to help themselves to any emeralds they could find. They looked a little taken aback, then saw my point, and I heard no more about fences.

The general security in the area subsequently deteriorated due to the activities of terrorists (or guerillas, depending on one's point of view) and the mine, and eventually the farm, had to be abandoned.

The deposit is typical of many small emerald mines in Rhodesia.

The Mintabie Opal Field
Grahame Brown, F.G.A., F.G.A.A.
Brisbane, Australia

This "new" opal field was, in fact, discovered in 1931. However, the development of mining of this field has been very slow. Remoteness of its location; harshness of its environment; chronic drought; and the extreme toughness of the opal-bearing rock have formed the major factors which have controlled the slow but sporadic development of this important opal deposit.

Mintabie is located (Fig.1) in the remote north of the Australian State of South Australia - approximately 400 km north-west of Coober Pedy. The small, nearby town of Marla acts as the general administration centre for Mintabie. The recent surge in mining activity at Mintabie can be attributed to two factors:

bulldozers suitable for open-cut mining of the hard Mintabie sandstone have only recently arrived on the field; the first major opal strike only occurred in the year of 1977. These two factors have increased the tempo of mining at Mintabie so that the present mining population has reached 350.

The Mintabie Opal Field is the source of two very valuable forms of opal: Mintabie Black Opal, and Mintabie Semi-black Opal. Present workings are located on the edge of a NE facing scarp, which rises 20-30 metres above the level of the surrounding plain. One surprising feature of Mintabie is the presence of vegetation. In contrast to the arid appearance of other Australian opal fields, Mintabie is well-covered by drought-resistant mulga and mallee vegetation.

While other Australian opal deposits are located in sediments of Cretaceous (65-140 million years ago) age, Mintabie opal is found in a sequence of sandstones of Ordovician-Devonian (350-500 million years ago) age. The opaliferous Mintabie beds (Fig.2) contain within their sandstone mass, thin intercalated beds of shale - which act as impervious barriers to the downward percolation of the silica-rich solutions - that have been leached from the overlying strata. Additionally, the Mintabie Beds display cross bedding - indicating a fluvatile environment for their deposition. Although extensive in area, but relatively thin (20-30 metres thick), the opal-bearing Mintabie Beds are overlain by Cretaceous shales and Tertiary sandstones, which in some places have been weathered to form sand dunes. In many areas, the upper sandstone strata have been silicified to form a resistant quartzose silcrete capping. Upper levels of the Mintabie Beds are characterised by being strongly jointed; however, the lower levels are formed from massive unjointed sandstone, which rests comfortably upon opal-barren sandstones of Ordovician age.

Opal, both potch and precious opal, occurs abundantly throughout the whole sequence of the Mintabie Beds; with the much more abundant potch occasionally developing into precious opal. At Mintabie, opal occurs in:

- a. Horizontal 'levels' associated with partings along the bedding planes;
- b. Horizontal 'levels' associated with the upper surfaces of the thin impervious shale bands;
- c. Arcuate 'levels' associated with the surface of the cross bedding structures;
- d. Infillings in oblique and near-vertical joints in the upper levels of the Mintabie Beds.

Mintabie opal frequently displays a banded structure, with the precious opal usually being present in the lighter-coloured layers. These lighter layers usually lie on top of a layer of darker potch material. Careful cutting, so that the lighter-coloured precious opal is backed by darker-coloured potch, pro-

duces the famed Mintabie Semi-black Precious Opal. As well as Semi-black opal, True Black Opal is produced from the Mintabie Field. This black opal rivals the beauty and value of the better-known Lightning Ridge Black Opal. Unfortunately, the bulk of the Mintabie production is opal of moderate to poor quality. This considerable volume of opal is used for the manufacture of opal doublets and opal triplets.

Although open-cut methods currently dominate the production scene, increasing production costs are forcing the replacement of this method of mining by the less expensive process of underground mining. More and more Caldwell Drills, York Hoists, Self Dumpers, and Blowers are starting to appear on the Mintabie Opal Field.

To date, this "new" opal field hasn't been completely mapped, or indeed satisfactorily explored to determine the true extent of this opal field. We know the Mintabie Beds are extensive - but how opaliferous are they? We will have to leave the answer to this question to the next generation of geologists and prospectors.

References:

The factual content of this brief paper has been based on the text of the only publication available that describes this important opal deposit:

Barnes, L.C., Townsend, J., and Nicol, G.J. (1980) Opal in South Australia; Report Book No. 80/26; Dept. of Mines and Energy(SA)

I would strongly recommend this publication to any gemmologist who has an interest in Australian opal. The publication may be purchased from:

South Australian Department of Mines and Energy
191 Greenhill Road
Parkside 5063
South Australia

* See page 5 for Figures 1 and 2.

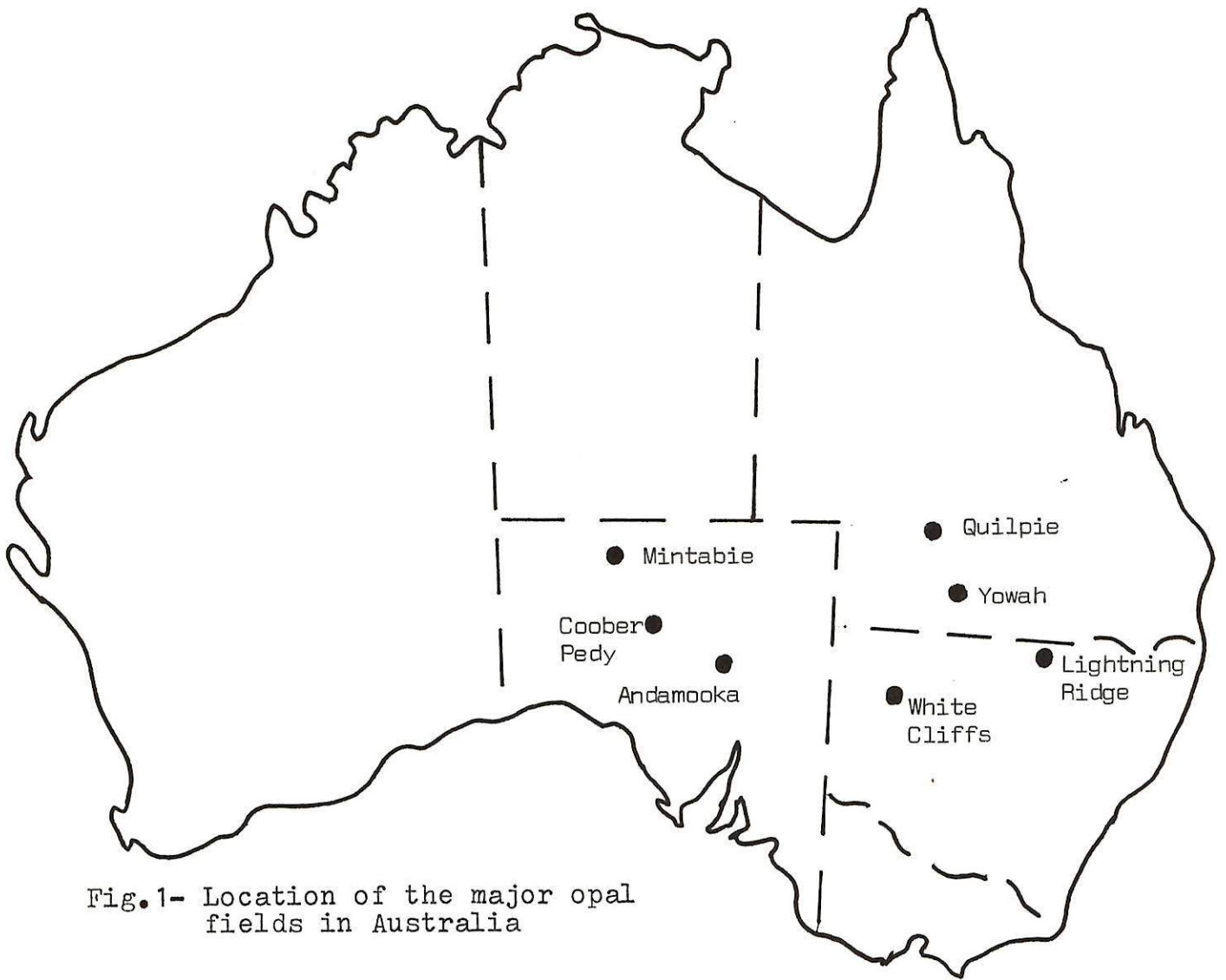


Fig.1- Location of the major opal fields in Australia

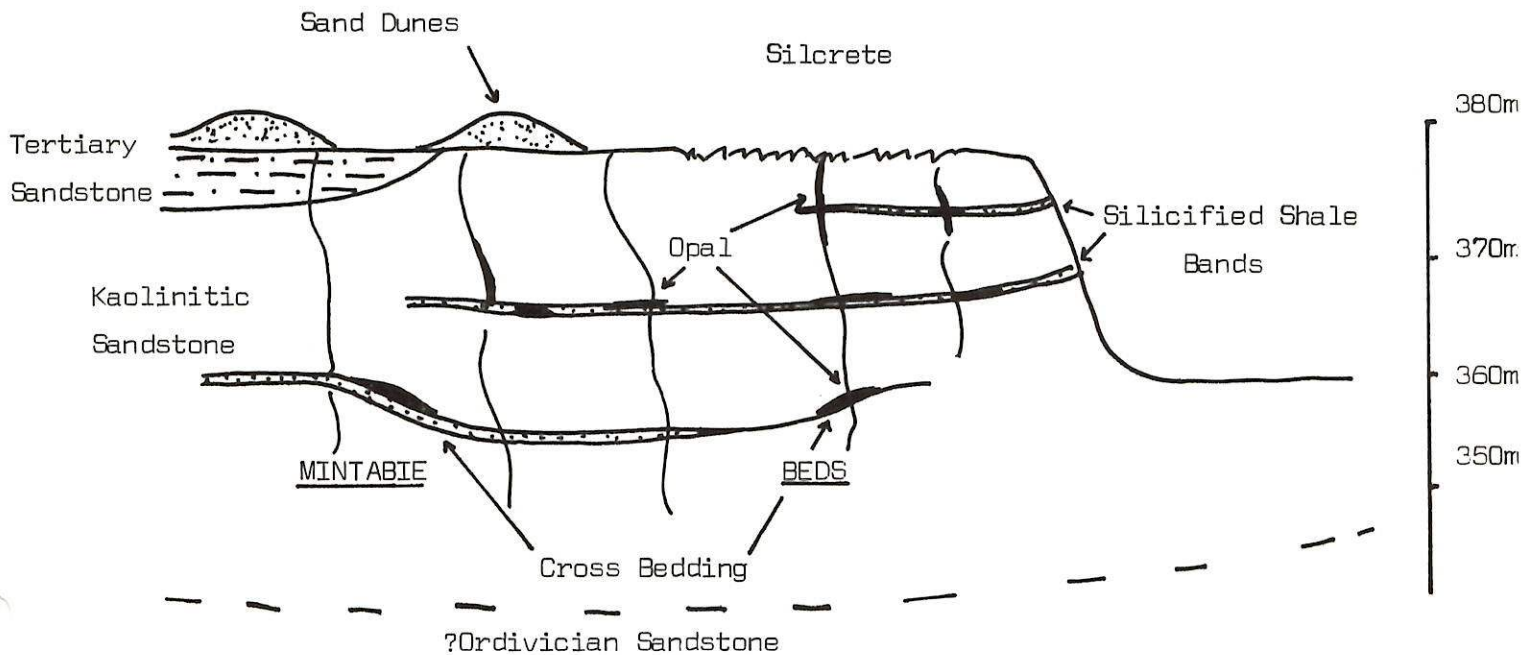


Fig. 2- Geological occurrence of Mintabie Opal
(Adapted from Townsend, 1980)

From the San Diego Chapter...
La Jolla, California

Meeting Place: 8950 Villa La Jolla Drive, Suite 2200
Time: 7:30 PM
Date: October 15, 1981
Speaker: Lewis Johnson
Topic: Gemstones Inclusions (slide presentation)

This is a meeting not to be missed. Professional photographer and gemstone lover, Mr. Johnston will show us inclusions as beautiful and tantalizing as the gemstones themselves.

A brief recap from our last meeting: What a Lesson! Listen carefully to dealers when they hand out information; they may not have all the facts there. Jack Abraham, Chairman of the Ethics Committee of the American Gem Dealers Association, was a great supplement to our meeting. Information and support were genuine and don't forget to call on him if you are in New York. Jack Abraham: 2 West 46th Street, Suite 810, New York, 10083. For those who missed him, ask one of the fortunate who attended the meeting to relate it to you.

Coming Events

Our national president, Mr. Joseph Tenhagen, F.G.A., G.G., will be our speaker at our first Christmas gala to be held December 6, at Cafe del Rey Moro, Balboa Park, at 12:00 noon. Mr. Tenhagen will present a slide presentation on Emeralds. A flier is on its way soon! Bring guests and potential members. For this occasion, we need more assistance, so if you would like to help make things run well, please contact any of the officers.

October 25th: mark your calendar for Investment Rarities Gemstone Auction. It will be held in Los Angeles at the Biltmore Hotel. For more information, call toll free- 1-800-328-1928.

Pansy Kraus will be displaying some of her unique and beautiful jade carvings at the Gemboree, October 24-25, at the Scottish Rite Masonic Rite Temple, 1895 Camino del Rio South, San Diego.

Fallbrook Gem and Mineral Society presents: Tourmaline Gemboree Show, October 17-18, at Fallbrook Union High School, South Mission Road and Stage Coach Lane.

Sneak Preview for our November topic: "The Psychology of Appraising". Do not miss it!

We are compiling a list of magazines directly related to our business of "gemology and gemstones". So far, we have: J.C.K., Goldsmith magazine, Lapidary Journal, National Jeweler, Gems and Gemology, the Journal of Gemology (England), the Australian Gemologist. Contact us if you know of any others.

++++

*** We thank R. Lary Kuehn, F.G.A.,G.G.,Dallas, Texas for his note on the Gemmological Association of Great Britain's 50th, recently held in London. "Anderson brought back memories; Gubelin gave us a lesson in chemistry, Dick Liddicoat and Bob Crowningshield were delightful".

I'm sure many members attended this event, and we'd appreciate a short note from each of you, for the Publication.

*** The date for the AGA meeting in Tucson is set: February 10, 1982, in the Cottonwood Room at the Double Tree Inn at 7:00 PM. I look forward to seeing and meeting many of you.

*** Lost, Strayed, Moved Members: If anyone knows the whereabouts of the following, please contact me. (Based on the returned ballots)

Charles M. Barr, G.G.
John E. Campbell, G.G.
Rockison Chen, Gem.
Richard F. Cohen, G.G.
Frederick J. Goynshor, F.G.A.,G.G.
Jeff J. Hoffmeister, G.G.
James R. Krol, G.G.
Joseph McCord, G.G.
Fritz A. Mertz, Gem.
Alan M. Morgan, G.G.
Maurice A. Paul, G.G.
Ronald M. Roland, G.G.
William D. Shoup, G.G.

New Members: The following have presented all qualifications and credentials and have been unanimously voted into membership by the Board. They are herewith being presented to the general membership:

John R. Bryant, G.G.

John R. Bryant and Associates, 7244
E. Indian School Road, Suite 14-A,
Scottsdale, Arizona 85251. Member,
AGS; C.G.

O. Dee Callaway, G.G.

1089- 44th Avenue, NE, St. Petersburg,
Florida, 33703. Member, AGTA; interest:
mineral crystals.

Barbara Glaze, F.G.A.

3945 Coronado Avenue, San Diego, Ca.
92107. President, Gemological Society
of San Diego; teaches gem i.d.; Jewel-
ry designer, mfr.; appraisal and con-
sulting.

Charles M.P. Hyland,G.G.	8228 Stonewall Drive, Vienna, Va., 22180. Member, Northern Va. Mineral Club. Interests: gem inclusions and their origins.
David A. Kaloci,G.G.	999 N. Pacific Street, Apt. A-309, San Diego, Cal. Member, San Diego Chapter, AGA.
R.W.K. Mackenzie,F.G.A.,G.G.	43 Long Avenue, Glenhazel 2192, Johannesburg, South Africa. Edu- cation Manager, The Jewelry Coun- cil of South Africa. Interests in research, teaching; background in geology and mining.
Raymond Mink,G.G.	1150 Savoy Street, San Diego, Ca. 92107. Member, San Diego Chapter, AGA.
Robert L. Rosenblatt,G.G.	1703 Laird Avenue, Salt Lake City, Utah, 84108. Former director of op- erations, Continental Independent Appraisals; member, Appraisers Association of America. Collector, rare gems and mineral specimen.
Thomas J. Terpilak, G.G.	1916 Grayslake Drive, Silver Spring, Md. 20906. Interests: corundum, diamond, synthetics. Member, Wash- ington Chapter, AGA.
Henry O. Terry, G.G.	1525 Mesa Verde Dr. E., Suite 203, Costa Mesa, Ca. 92626. Owner, Com- puterized Gem Labs. Former teacher, Santa Ana College, "Advanced Diamonds"
Edward B. Wesson, G.G.	P.O. Box 030-427, Las Olas Branch, Ft. Lauderdale, Fl. 33303. Interests: Burma rubies, Kashmir sapphires, Colombian emeralds and exceptionally rare gemstones.
Patricia J. Winckler, G.G.	2518 S. Holland Ct., Lakewood, Colo. 80227. Teacher-Community Coll. of Denver-"Basic and Advanced Gemology". Founder: Lewisville, Tex. Geological Club. Interests: colored stones and their inclusions.

ASSOCIATE MEMBERS:

Bettye R. Duke, (GIA)	5613 Beam Court, Bethesda, Md., 20014. Passed, Dia., Colored Stones, GIA; currently enrolled, Gem ID.
-----------------------	---

(Associate Members, cont.)

Marie Gallo (GIA) 5720 Bellevue Avenue, La Jolla, Ca.
92037. Diamond Grading, passed.

Bruno Hahmann (GIA) P.O. Box 1517, 14 Calle 9-02, Zona 11,
Guatemala City, Guatemala, Central
America. Second generation jeweler,
store founded, 1893.

Robert Holden (GIA) 29 Light Street, Baltimore, Md.21202.
Preparing for final with GIA. Student
Affiliate, AGS.

*** We received a letter from J. Paul Ouelette, G.G.,I.S.A. of
5743 West St. John Avenue in Glendale, Arizona, 85308, who is
rejoining the AGA. For your interest and information, he was
among the first 500 graduates of the GIA in 1949, and has extensively
studied antiques in New England and Europe. Owner and operator of
a gem laboratory, he has one of the SW's most complete libraries
on gems, precious metals, silver, china, crystal, antiques and
collectibles, and has been a member of the jewelry industry since
1937. We are happy to welcome him back to the AGA, and hope to
hear more from him.

*** Our thanks to Robert L. Rosenblatt for his \$55.00 donation to
the AGA.

*** A note from Darlene M. Freeman,G.G.,F.G.A., of 3713 Naughton
Avenue, Belmont, California, 94002, informs all of us of her
trip to London on November 16 for the awards presentation of her
F.G.A. degree. Congratulations!

*** Address Changes:

Jacques Brodman, G.G.- 1255 Phillips Square, Suite 1105,
Montreal, Quebec, Canada H3B 3G1.

Tannis Bilkoski, G.G.- 502-505 Eighth Ave. SW, Calgary, Alberta,
Canada T2P 1G2

Philip R. McPharlin, G.G.-4952 Warner Ave.,Suite 307, Huntington
Beach, Cal. 92649

George F. Kenner, Sr.,G.G.-8347 La Mesa Blvd.,La Mesa, Cal.92041
Hamilton W. Stitt,FGA - 14 Salisbury Ave.,Apt. 42,Brockville,
Ontario K6V 2T5

(Address Changes, Cont.)

Kurt W. Arens, G.G. - P.O. Box 1469, Phoenix, Arizona, 85001.

Walter Johnson, G.G. - P.O. Box 309, Harper's Ferry, W. Va., 25425.

Credential Corrections, additions:

R. Lary Kuehn, F.G.A., G.G., Dallas, Texas.

Judith M. Grant, G.G., F.G.A., Carmel-by-the-Sea, California.

Mary E. Barr - G.G., Newport Beach, California.

!!!! UPDATE ON BY - LAW VOTES !!!!

Establishment of Associate Member Status - Passed; one dissenting.

Establishment of P.G. as Full Member - Denied.

Establishment of F.G.A.A. as Full Member - Pending until Nov. 15th.

WASHINGTON, D.C. AGA MEETING

Executive Board Meeting, October 2, 8:00 PM: All Officers were present; invited guests included Mr. Tony Bononno, F.G.A., past-President of the AGA, and Theresa Zook, F.G.A.

Among items discussed were: the P.G.-F.G.A.A. membership question, raising national dues, new AGA membership certificates and cards. (New certificates will be issued in the ensuing months.)

General Assembly, October 3, 7:00 PM: The guest speaker for the meeting of the general membership was Mr. Joseph Tenhagen, F.G.A., G.G., who presented a slide program on separating the more difficult synthetics from their natural counterparts.

A brief recap of the slides presented: a red diamond crystal; various diamonds in crystal and cut form; a 1.01 carat marquis diamond with red garnets included; some slides utilizing phase contrast microscopy.

The following slides of colored gemstones were viewed: rubies - typical inclusions of silk, angular inclusions and straight color zoning. Proof that even so-called "flawless" Kashan synthetics can be identified by their dust particles (sometimes in long streamers), as well as the twisted veils and feathers in included stones. There were excellent slides of the (hexagonal) platinum platelets included in Chatham rubies.

Synthetic emerald slides of Gilson and Chatham stones were viewed, showing their twisted veils, 2-phase inclusions, and the straight, "venetian-blind" effect of synthetic origin.

Regency-created hydrothermal emeralds were seen showing the seed head with nail-shaped inclusions extending from the seed.

Typical Ceylon blue sapphire stones were viewed with straight silk inclusions. Australian sapphires evidenced included plagioclase crystals and some showing the "lily-pad" effect.

In comparison, typical Verneuil stones with gas bubbles, curved color bands and striae were seen, while Chatham synthetic blue sapphires showed the typical twisted veils, feathers, and (hexagonal) platinum platelets. Slides were also seen of the atypical straight color banding in these stones.

Also seen and discussed was a colorless specimen of rock crystal quartz with golden (yellow) rutile inclusions; a large, 2-phase inclusion in a Morganite; and whorled bubbles in a synthetic spinel.

All slides were a portion of Mr. Tenhagen's private collection, photographed with a 35 mm Nikon using Kodak Extachrome film, ASA 160 tungsten light, with dark-field illumination. Magnification varied from 10x - 60x.

-AGA DUES-

Due to increased operating costs, the Executive Board has approved an increase in dues for 1982, the first such increase. Please mark your ballot and mail it to the main office before December 31, 1981.

- Remain the same (\$15.00)
- \$20.00 yearly (overseas \$30.00)
- \$25.00 yearly (overseas \$35.00)
- \$30.00 yearly (overseas \$40.00)

AGA By-Laws, Article II, Section 1 (p): "To establish from within AGA membership a speaker's bureau list."

We're preparing a speaker's list and need volunteers who would be willing and able to speak before the AGA or any outside group desiring a speaker in the field of gemology. If you are available, please fill out the following and mail it to the main office:

What are your special interests or areas of concern or expertise?

Name-

Address-