

The Opal Express

American Opal Society
P.O. Box 4875
Garden Grove, CA 92842-4875



**Volume #36 Issue #09
September 2003**

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Important Dates:

Board Meeting: September 8
7:00 PM at Ball Jr. High School

General Meeting: September 11
Speaker: Mike Kowalsky on

**How To Identify Created
Opal**

— GENERAL MEETINGS —

2nd Thursday of the Month
7:00 pm - 9:00 PM
Garden Grove Civic Women's Club
9501 Chapman Ave.
(NE corner of Gilbert & Chapman)
Garden Grove, CA

MEETING ACTIVITIES

Opal Cutting Advice Guest Speakers
Slide Shows Videos Other Activities

General Meeting: September 11th



The American Opal Society

<http://opalsociety.org>

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Article Deadline is the 20th of the month prior to each issue

Are Your Dues Due Now?

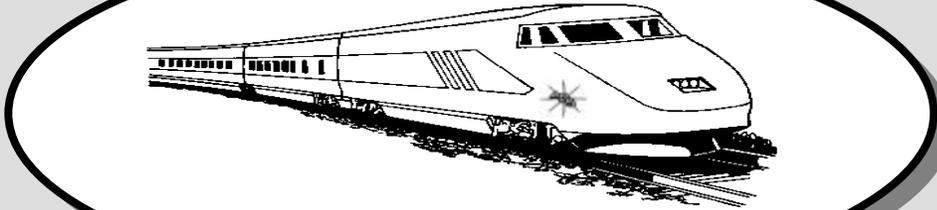
PLEASE CHECK YOUR ADDRESS LABEL. If your label shows the current month/year your dues are DUE NOW. If the date is older, your dues are overdue.

A Renewal Grace Period of two months will be provided. If your dues are due now you will receive two additional issues of the newsletter. Please note, however, that as the system is now set up, if your renewal is not received you will be AUTOMATICALLY dropped from membership thereafter. It is your responsibility to assure your dues are current.

Thank you,
The Editor

The Opal Express

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Opal
Society



September 2003

Volume 36 Issue 9

President's Message

By Pete Goetz

Hi Folks,

The **OPAL SHOW** is only a couple months away. Arrangements seem to be going well. Still need some **VOLUNTEERS** to help keep things at the show running smooth. I am looking forward to a "really great Show." The shop is functional, so give Stan a call. The shop is available Wednesday nights from 7:00 to 9:00 to 10:00-ish.

If you missed last months general meeting, you missed a good one. We have started a new feature at the general meetings. Every month members can bring in finished, unmounted opals and have them evaluated by a peer group using the AOS appraisal Form. Last month, several members found they had stones worth more than they thought, and of course some were not so lucky. However your fortune turns, I guarantee you will have fun. My goal in having the members learning to use these appraisal forms is to increase the overall expertise of the general membership.

Opal Workshop

The AOS opal workshop is at **Ball Jr. High School** on 1500 W. Ball Road, Anaheim, CA. It will be available for AOS members on Wednesday. Contact **Stan McCall** for details at **(714) 220-9282** if you plan to attend a session.

September Snippets

by Barb Whyre

Charles Wells, local citizen Georgie's brother, called into Heritage Cottage for a sticky beak after many years. He recalled Sunday dinners with the Graham Brothers as he glanced out in back, looking for the two toilets. Apparently, visitors believed each brother had his own. In fact, one was but a disguise for the opal mine!

As we walked back towards the front, I pointed out the pussy cat tracks in the old concrete and Sid's signature, written in candle black on the inside of the Cottage door. Charles seemed deep in thought, "yes, a lot of old memories", he reiterated "a step back in time."

"Members Only" Area on Website

The AOS website has been re-hosted with a new web host company, <http://readyhosting.com>. The new hoster provides capabilities that the old one didn't have. We now have a true password protected area. Two links are there: The Opal Express Archives and Opal Collecting Sites. The archives go back from the present to 1994 and in PDF and HTML format. An account name and password are required to get into the protected area. This password will change periodically and will be in the current issue of the Opal Express. The link is: http://opalsociety.org/aos_members_only_area.htm.

To login into the protected area, click the following when prompted: **Name:** member **Password:** nopotch

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A New Era For Opal Nomenclature

Anthony Smallwood FGAA, GG
Chairman, G.A.A. Opal Nomenclature Sub-committee

NOTE: Due to a wide variation of colour values portrayed by web browsers and PC monitors, the sample colourings shown in this article can be taken as representative only. For a true representation of the colour definition and tone values of the illustrations reproduced in this paper, please purchase a copy of the original article published in *The Australian Gemmologist* Volume 19, Number 12, October-December 1997, or purchase our [Opal Nomenclature Poster](#).

(See <http://www.austgem.gil.com.au/opalpost.html>)

2nd Note by AOS Editor – Due to the black and white printing of the *Opal Express*, the true colors of the opal photos can not be appreciated. To see the true colors, this newsletter can be seen in the *Opal Express* Archives at the AOS website at <http://opalsociety.org>. Also, some spellings are in the English version. This paper has been reprinted with the expressed permission of the Gemmological Association of Australia.

Abstract

Opal is a relatively common mineral species that is found in many locations world wide. For many years a reason for the spectacular phenomenon known as *play-of-colour*, as seen in precious opal, remained a well hidden secret. It was not until the 1960s that Australian scientists working at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) used a new instrument now known as the electron microscope to reveal the inner structure of opal and how this is responsible for generating the *play of colour* of precious opal.

Opal often was referred to as a 'semi-precious gemstone', until unique Australian black opal was discovered and successfully marketed. Today, all varieties of precious opal, which are mined in the Australian states of New South Wales, South Australia and Queensland, support a \$A500 million per year industry.

One problem that the opal industry has been required to face, however, is how does one describe a gemstone that occurs both with and without a *play-of-colour*, in almost every colour of the rainbow, in every tone of lightness and darkness from black to white, and in every degree of transparency from opaque to perfectly transparent. Also this unique gemstone displays differences in mineralogy that reflect the varying geological environments in which it forms.

The opal nomenclature that follows is a result of three years of striving within Australia's opal industry to achieve co-operation and to formulate a nomenclature for opal which is accepted uniformly throughout the industry.

INTRODUCTION

For many years the terminology and nomenclature used to describe opal has been widely discussed and debated by gemmologists and those members of the gem and jewellery industry who have an interest in this gemstone. Aspects of this long-running discussion can be seen in the long list of papers published throughout the forty year history of *The Australian Gemmologist*. But, how to best describe opal (arguably the most beautiful of gemstones) has been a contentious and difficult issue for a very long time — and may well remain so for some

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time to come. However, as a consequence of factors such as: growing international and local awareness of opal as a major Australian resource; the emergence world-wide of a real desire to standardise all terminology related to gemstones; and the ever growing number of synthetics and imitations that are appearing in world markets; it has become necessary to agree on some well based concepts of how a unique gem material, such as opal, should be described. It was late in 1993 that the Australian Gemstone Industry Council requested the then President of The Gemmological Association of Australia (GAA), Grahame Brown, to initiate investigations into the possibility of establishing a uniformly accepted nomenclature for opal. After a short time, a working sub-committee of the GAA was formed that consisted of representatives of The Gemmological Association of Australia, the Australian Gem Industry Association (AGIA), and the Lightning Ridge Miners Association (LRMA). Now, after three years of discussion, correspondence, and a plethora of drafted documents, and what seemed to be a never ending train of ideas and criticisms, a final draft nomenclature has been agreed-to, ratified, published, and is presented in this paper.

The Australian Gemstone Industry Council (AGIC) has accepted this nomenclature in its final draft, as has the GAA's 1996 and 1997 Federal Conferences in Tasmania and Perth — albeit with one or two small amendments to the final draft. Now the AGIC hopes to actively progress production of a full colour publication and video on this opal nomenclature for distribution on a worldwide basis over the next twelve months. As Chairman of the GAA's Opal Nomenclature sub-committee I would like to express my gratitude to Jack Townsend (South Australia), Kathy Endor (Queensland) and Andrew Cody (Victoria) for their untiring efforts and fruitful discussions. Also, this author wishes to express his appreciation for the work and constant liaison of the AGIA sub-committee members Glenn McKean, Drago Panich, Peter Sherman, and Peter Evans, as well as the generous support and hospitality offered by members of the LRMA — in particular Joe Schellnegger, Maxine O'Brien, and Frank Palmer.

I would encourage all members of the GAA to read and to use this nomenclature — in their every day activities, such as buying and selling, and in scientific correspondence and lectures. This nomenclature remains, according to GAA Past President Ronnie Bauer and the AGIA's Andrew Cody, a 'living document'. As time passes there will be, no doubt, more discussion and criticism of this nomenclature. This will be most welcome, as are any questions — all of which may be forwarded in writing to the GAA's Opal Nomenclature Sub-committee either care of the Federal Office of the GAA at P.O. Box A791, Sydney South NSW 1235, or direct to the author at P.O. Box 692, Sutherland NSW 2232.

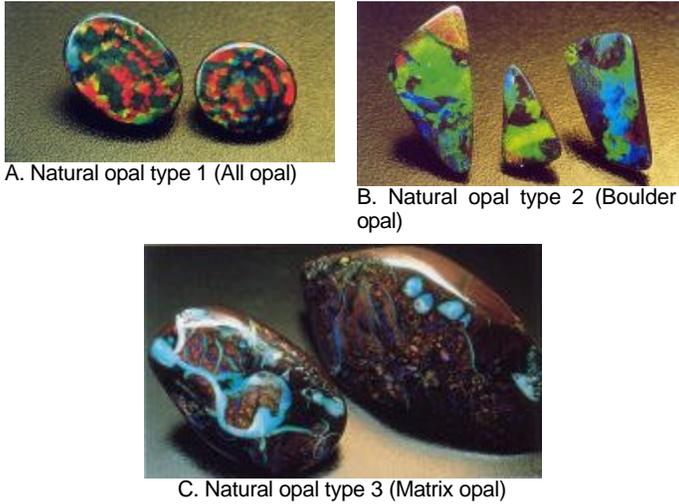


Fig. 3. Types of natural opal. (A) Natural opal type 1 (B) Natural opal type 2 (C) Natural opal type 3. (Photographs, R. Weber).

VARIETIES OF NATURAL OPAL

The variety of natural opal is determined by the two characteristics of *body tone* and *transparency*.

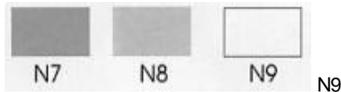
Body Tone

The *body tone* of an opal is different to the *play-of-colour* displayed by precious opal. *Body tone* refers to the relative darkness or lightness of the opal, while ignoring its *play-of-colour*. This is assessed on a Scale of *Body Tone* (Fig 4.).

The boxes (below) comprising this scale, represent approximate values of body tone in equal intervals from black to white. This arrangement is in agreement with all known scales of tone used in colour science, and is well illustrated in the commercially available *Rock-color Chart* produced by the Geological Society of America. An AGIA scale of *Body Tone* is being developed, using computer-generated graphics, and when available, will correlate with the GSA *Rock-color Chart*.



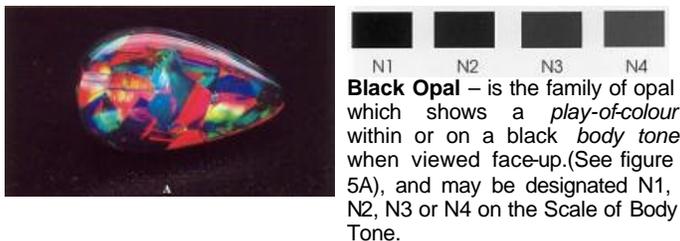
Black Opal



Light Opal

Fig. 4. Approved scale of body tone for precious opal

There are three varieties of opal based on *body tone*.



Black Opal – is the family of opal which shows a *play-of-colour* within or on a black *body tone* when viewed face-up. (See figure 5A), and may be designated N1, N2, N3 or N4 on the Scale of *Body Tone*.

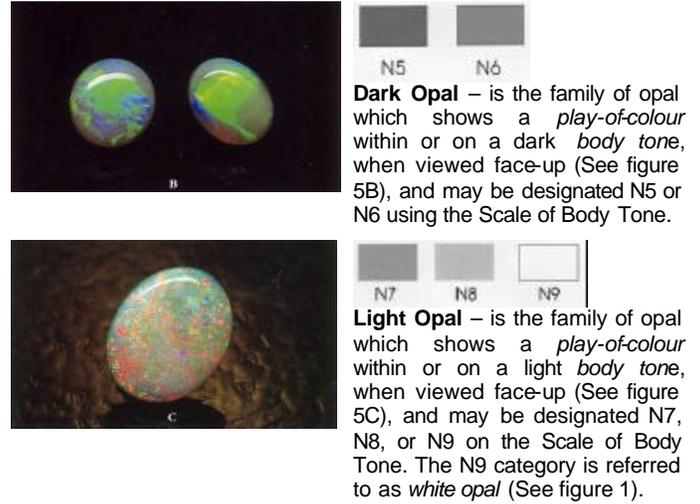


Fig. 5. Varieties of opal based on body tone. (Photographs, R. Weber)

Opal with a distinctly coloured body (such as yellow, orange, red or brown) should be classified as black, dark or light opal, by reference to the Scale of *Body Tone*, and also have a notation stating its distinctive hue appended to its determined *body tone*. (See figures 6, 7, 8, 9 & 10).

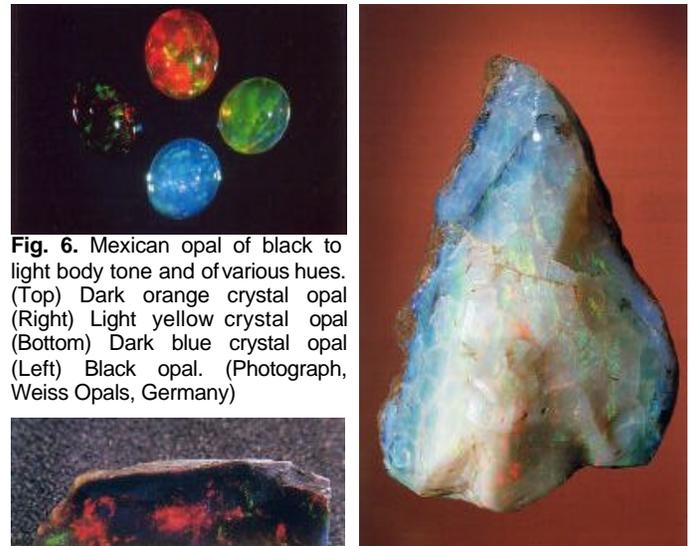


Fig. 6. Mexican opal of black to light body tone and of various hues. (Top) Dark orange crystal opal (Right) Light yellow crystal opal (Bottom) Dark blue crystal opal (Left) Black opal. (Photograph, Weiss Opals, Germany)



Fig. 7. Black crystal opal from Virgin Valley (USA). (Photograph, P. Brown)

right) Dark opal. (Photograph, G. Brown)

Transparency

Opal shows all forms of diaphaneity that range from transparent to opaque. Natural precious opal which is transparent to semi-transparent is known as *crystal opal* (Figs. 11A-C). *Crystal opal* can have either a black, dark or light *body tone*. In this context, the term 'crystal' refers to the appearance of the opal and not its crystalline structure.

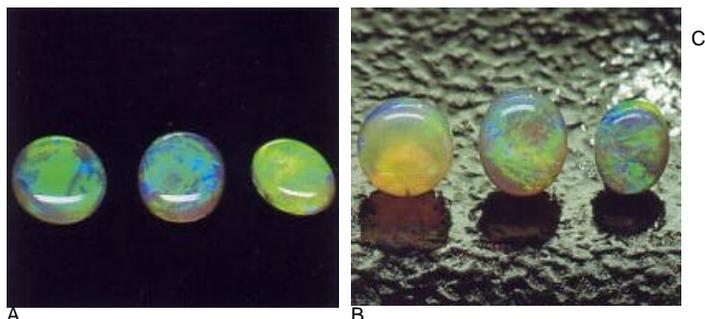


Fig. 11. *Crystal opal* displaying its identifying diaphaneity. (A) Crystal opals shown face-up against a black background which enhanced the brilliance of these opals' *play-of-colour*. (B) The same crystal opals shown face-up against a reflective background that subdues the opal's *play-of-colour*. (C) The same crystal opals viewed in transmitted light. Note the *play-of-colour* of these opals is hidden, and their true transparency is revealed. (Photographs, R. Weber)

OPAL TREATMENTS

Opal can be subjected to various types of treatment. Present CIBJO guidelines state that any method of treatment other than standard cutting and polishing must be disclosed and the process used specified on all invoices, advertising, and commercial documents. Types of treatments include colour and/or tone enhancement (Fig. 12), heating, painting, dying, resins and waxes, oiling or any application of chemicals. Opal also may be treated to change its natural appearance or durability. (See the discussion on composite opals, below). The *body tone* of opal is often enhanced (usually appearing darker) in some opal inlay jewellery where a thin piece of solid crystal opal has black paint or black glue applied, or the opal is set above black painted jewellery.

COMPOSITE NATURAL OPAL

Composite natural opal consists of natural opal laminates, manually cemented or attached to another material. The opal component is natural opal. There are three main forms of composite opal:

Doublet Opals – are a composition of two pieces where a slice of natural opal is cemented to a base material (Fig. 13).



Fig. 12. Treated (carbonised) dark Andamooka matrix opals. (Photograph, R. Weber)



Fig. 13. A ring-mounted black Lightning Ridge-type composite doublet opal. (Photograph, G. Brown)

Triplet Opals – are a composition of three pieces where a thin slice of natural opal cemented between a dark base material and a transparent top layer (usually of quartz or glass).

Mosaic and Chip Opals – are a composition of small flat or irregularly shaped pieces of natural opal cemented as a mosaic tile on a dark base material (Fig. 14) or encompassed in a resin.

SYNTHETIC OPAL

'*Synthetic Opal*' (Fig. 15A) is material which has essentially the same chemical composition and physical structure as natural opal but has been made by laboratory or industrial process. Synthetic opal composites exist as synthetic opal doublets, triplets or mosaics. These must be disclosed as *synthetic opal composites* (Fig. 15B).

IMITATION OPAL

Imitation Opal (Fig. 16) is material which imitates the *play of colour* of natural opal, but does not have the same physical and chemical structure or gemmological constants as natural opal.



Fig. 14. A mosaic dark opal composite. (Photograph, R. Weber)



Fig. 15A. A Gilson™ synthetic black opal. (Photograph, G. Brown)



Fig. 16. A 'thin-film' imitation dark opal by Pauley. (Photograph, R. Weber)

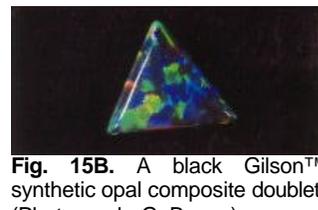


Fig. 15B. A black Gilson™ synthetic opal composite doublet. (Photograph, G. Brown)

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CLASSIFICATION REPORTS

The classification reports for the following types of opal should include the following:

Natural Opal

1. **Type** of opal.
2. **Variety** of opal, as black opal, dark opal or light opal with a body tone value classification from N1 (black) to N9 (white) based on the Scale of Body Tone.
3. **Transparency** as opaque, translucent or transparent. Make note if it is *crystal opal*.
4. **Weight and dimensions**.

Treated Opal

1. **Type** of opal.
2. **Variety** of opal as black, dark or light opal.
3. **Transparency** as opaque, translucent or transparent. Make note if it is *crystal opal*.
4. **Type of treatment** and process if known.
5. **Weight and dimensions**.

Composite

1. **Type** of composite, i.e. doublet, triplet, mosaic or chip opal.
2. **Treatment process**, where relevant.
 1. **Dimensions**.

Synthetic and Imitation

1. **Gemmological category** (including manufacturer, if known).
2. **Description** (body tone).
3. If **composite**, mention **type** i.e. doublet, triplet, mosaic or chip.
4. **Weight and dimensions**. Only dimensions if composite.

Origin

Any indication of the origin of opal, by the use of geographical location, should not be used unless it is qualified as an indication of the type of locality only as recommended by the International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones (CIBJO) e.g. Lightning Ridge type black opal.

HOW TO USE THE NEW OPAL NOMENCLATURE

This nomenclature for opal has been designed for use throughout the gemstone and jewellery industry, not only in Australia but internationally. While preparing this nomenclature, the sub-committee has been cognisant of conventions of international trade organisations, such as the International Confederation of Jewellery, Silverware, diamonds, pearls and stones (CIBJO), the International Colored Gemstone Association (ICA), as well as the linguistic problems associated with different languages and the differing connotations these languages may place on an internationally acceptable nomenclature.

This new nomenclature has not been designed to force any changes to the various colloquial terms used to describe opal in Australia, or indeed in countries overseas such as Mexico. Colourful language, Australian colloquial terms for opal, and terms that have been a part of the Australian scene for hundreds of years have added significantly to the mystique and folklore of everyday language used on the opal mining fields. Expressive local terms and older historical terms always will exist in the opal miner's vocabulary. These will remain to have their rightful place in our gemstone history and in the tale-telling for years to come.

The purpose of the nomenclature, therefore, remains to provide a basic description of the gemstone we all prize and know as opal. This nomenclature is for everyone to use and understand. Simple descriptive terms, that can be used by the majority of people, from the customer to the scientist, have been chosen. These provide the gemstone industry as a whole with a logical and unbiased way of grading and evaluating opal. However, simple terms do become difficult when the many different types, formations, pseudomorphic fossil replacements, mineralogical types, and geological occurrences of Australian opal are considered.

Having said that, there are a few items of terminology which it is hoped this nomenclature will remove from common usage. In particular, the terms that have been deliberately removed, due to the linguistic problems they create, are 'semi-black', 'grey', and 'solid'.

To begin with the first part of the nomenclature, mention is made of *precious opal*, *potch* and *common opal*. The best way of determining the difference between these is to observe whether or not the opal you are viewing shows the phenomenon which we all know as *play-of-colour* (compare Figs. 1 & 2). It is possession of this optical phenomenon for which opal is most prized. The differentiation between these basic forms of opal is therefore quite simple. If the opal displays a *play-of-colour* it is termed *precious opal*. If a *play-of-colour* is not displayed, then the opal is either *common* or *potch opal*. While it is recognised that the term *precious* is neither a scientific nor gemmological term, it is retained in this nomenclature for simplicity, and with the intention of further enhancing the value of opal as a gemstone by removing it from any historical association with 'semi-precious' gemstones.

In an attempt at keeping the nomenclature simple to use, the terms *common opal* and *potch opal* have not been separated. It must be recognised, however, that there are distinct mineralogical differences between *potch* and *common opal*. (Jones & Segnit, 1971).

The term 'solid' has been removed from opal terminology, for the simple reason that all types of opal are essentially solid

from a scientific point of view. That is, opal does not exist naturally either as a liquid or a gas. 'Solid' has been replaced by the gemmological term *natural opal*. Correlating with this use is the recommendation that when describing doublets and triplets that the term *composite* be used instead of 'assembled' (See Figs. 13, 14 & 15B). This also is the terminology currently recommended by CIBJO.

Essentially there are three types or forms of *natural opal*, which are termed simply *opal*, *boulder opal* and *matrix opal* (See Figs. 3A, B & C). Perhaps the most contentious issue in the nomenclature concerned introduction of the term *body tone*, to describe the comparative lightness or darkness of an opal as distinct from its *play-of-colour*. Technically, it would have been best just to have two types of 'body tone' — either 'black or white' or just 'light or dark'. However, the sub-committee rightly decided not to attempt to change too much of the terminology that had been in common use for over a hundred years. So, inclusion of the term *black opal* was considered to be an imperative. Following much discussion the term *body tone* was included in the nomenclature to describe the comparative lightness or darkness of opal — irrespective of its *play-of-colour*. The term *tone*, which is used by colour science, is in agreement with terminology used internationally to describe the lightness or darkness of particular *hues* or *colours*.

The Scale of Body Tone, as illustrated in the nomenclature above (Fig. 4), ranges from N1 to N9. The prefix "N" reflects the neutral tone of this scale. The steps in the scale of body tone, which are arranged to indicate approximately equal decreases of darkness, are difficult to reproduce accurately on the printed page. A rough gauge can be obtained by printing this scale with the assistance of a good computer and a quality laser or ink jet printer.

After examining current industry standards, the N4 category was decided to be the cut-off point for *black opal*. The AGIA is currently attempting to produce a scale of body tone, using commercially available computer scanning devices and suitable software. However, at the time of publishing this paper, this scale is not yet available. The current reference, used by the Lightning Ridge Miners Association, is the neutral tone scale specified in the American Geological Society's *Rock-colour chart* †. This has proved to be a good guide, for in most instances it will be possible to correlate the different 'tone scales' into a simple and repeatable system. An acceptable descriptive term was sought also to describe those opals that have distinct body colours or hues, such as those displayed by both *Mexican fire opal* and *honey opal* from Lightning Ridge — considerable amounts of which consists of *common* or *potch opal*. However, as an acceptable all round term could not be found to describe these opals, the committee decided to describe them by determining their body tone/s, their primary and secondary body colour/s or hues, and their transparency (See Figs. 6, 7, 8, 9 & 10).

- To determine the *body tone* of an opal, then, one examines the piece of opal, face-up, and determines (by visual comparison) its position in the scale of body tone.
- If the tone of the opal appears darker than N4, then the opal may be classified a *black opal* (Fig. 5A). Consequently, any opal with a body tone darker than N4, irrespective of hue, can correctly be termed *black opal*. Some *boulder opal* possesses this body tone, so it is very correctly termed *black boulder opal*. It is also appreciated that some very dark red Mexican-type opals would have dark enough body tones to be categorised as *black opal* (See Fig. 6, left).
- If the opal is lighter than N4, and its tone corresponds to N5 or N6 on the scale of body tone, then it is classified as *dark opal* (Fig. 5B). If, in addition, this opal has a decided *hue*

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colour, it is additionally classified as, for example, a *dark blue opal* (See Fig. 6, bottom).

- If, on the other hand, the *tone* of the opal corresponds to N7, or lighter, it is classified as *light opal* (Fig 5C). If this *light opal* also has a hue, then it is termed, for example, a *light yellow opal*.

When to term an opal a *crystal opal* also provided considerable discussion. The key to classification as *crystal opal* is really the transparency of the opal (See Fig. 11). Perhaps a better term would have been 'transparent opal'; but any change in terminology from *crystal* to 'transparent' may take many many years to progress. The obvious problem with the term *crystal opal* is, of course, the basic fact that that opal has no crystal structure. Again the sub-committee decided that it was unwise to change a term that had been in common use for so many years. The sub-committee further believes that overseas gemmological communities may yet force a change in this usage, if strict terminology is ever to be implemented.

The range of *transparency* considered acceptable for defining *crystal opal* (transparent to semi-transparent) was taken straight from Robert Webster's discussion on transparency in his world-renowned textbook *Gems*. The committee decided that *transparency* did not need to be re-defined in the nomenclature; but just stated as a classifying category.

To grade the transparency of an opal with the nomenclature, how transparent the opal is must be determined. If the opal is only translucent, then it is not termed *crystal opal*. It should be remembered that in some instances the *play-of-colour* of *crystal opal* will be so strong or brilliant that assessment of transparency, by the normal 'read-through' criterion, may not be possible as the opal can not be 'read-through'. When this occurs the best test of transparency would be to 'look-through' the opal with transmitted light. If transparency exists then this will be readily apparent. If the material remains only translucent, then it is correctly labelled as *light opal*. It is hoped that future scientific advances may yield a better and more accurate method of assessing transparency.

A note also should be made concerning the removal of the term 'jelly' opal. The basic facts are that due to the extreme transparency of this opal it becomes a type of lower quality *crystal opal* that displays subdued low quality *play-of-colour*. In spite of any restriction applied by this terminology the term 'jelly' opal will probably remain in colloquial use for many years to come.

The description of composite stones (Figs. 13, 14, 15B) requires only a small change in nomenclature. Instead of these opals being described as 'opal doublets' or 'opal triplets', the nomenclature emphasises their composite nature by terming

these *doublet opals* and *triplet opals*. In this terminology, which emphasises the composite nature of these opals, it is the first word of the term that precisely identifies the material.

The rest of the nomenclature discusses opal treatments, synthetics and imitations. These are not associated with the descriptive nomenclature for natural opals, but have been included to complete the nomenclature. These descriptions are in accordance with the latest edition of CIBJO's *Classification of materials and Rules of application for diamonds, gemstones, and pearls*.

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- † Copies of the *Rock-color Chart* may be purchased either from The Geological Society of America, P.O. Box 9140, Boulder Colorado 80301 (for US\$26.00, plus postage), or from Prospectors, P.O. Box 339, Seven Hills NSW 2147 (for \$A48.00).

September Gem & Mineral Shows

- 4-7--SAN BERNARDINO, CA:** 2nd annual tailgate event; Orange Belt Mineralogical Society; Devore KOA Campground, 1707 Cable Canyon Rd.; Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 9-5, free admission; contact Lyle Strayer, 2980 Duffy St., San Bernardino, CA 92407, (909) 887-3394; e-mail: gilhamgh@sce.com.
- 6-7--MISSOULA, MT:** Show, "Rubies at Ruby's"; Hellgate Mineral Society; Ruby's Inn & Convention Center, 4825 N. Reserve; Sat. 10-6, Sun. 10-5; contact Bob Riggs, 14 Holiday Ln., Missoula, MT 59801, (406) 543-3667.
- 6-7--ROSEBURG, OR:** Show, "Douglas County Rocks, Minerals and Fossils"; Umpqua Gem & Mineral Club; Douglas County Fairgrounds, I-5 exit 123; Sat. 10-6, Sun. 10-4:30; free admission; 12 dealers, demonstrators, door prizes, raffle, competitive and noncompetitive displays, silent auction, wheel of fortune, kids' rock hunt 11 and 2 each day; contact Don Young, (541) 672-2936, or Cindy Black, (541) 430-8986.
- 10-14--DENVER, CO:** Show, "CO Mineral & Fossil Show"; Martin Zinn Expositions; Holiday Inn-Denver North, 4849 Bannock St., intersection of I-25 and I-70; Wed. 10-7, Thu. 10-7, Fri. 10-7, Sat. 10-7, Sun. 10-5; free admission; 200 U.S. and international dealers, free shuttle to shows at the Merchandise Mart; contact Martin Zinn Expositions, P.O. Box 999,

Evergreen, CO 80437-0999, e-mail: MZ0955@aol.com; Web site: www.mzexpo.com.

12-14--DENVER, CO: Show, "Denver Gem & Mineral Show"; Greater Denver Area Gem & Mineral Council; Denver Merchandise Mart, 451 E. 58th Ave.; Fri. 9-6, Sat. 10-6, Sun. 10-5; adults \$5, students and seniors \$3, children free; contact Regina Aumente, P.O. Box 621444, Littleton, CO 80162, (303) 233-2516; e-mail: info@denvermineralshow.com.

19-21--SANDY, UT: Show, "2003 Gemboree"; Wasatch Gem Society; South Towne Expo Center, 9575 S. State St.; Fri. 10-6, Sat. 10-6, Sun. 10-5; adults \$2, kids and scouts and leaders in uniform free; grab bags, Wheel of Fortune, slabs, silent auction, door prizes, tools, show cases, jewelry, spheres, specimens, demonstrations, dealers; contact Carlyle Curtis, (801) 364-8253, or Fred Lacey, (801) 484-6563.

20-21--COOS BAY, OR: Show; Far West Lapidary & Gem Society; 160 Central Ave.; Sat. 10-6, Sun. 10-4; free admission; indoor show, during the Bay Area Fun Festival; dealers selling rough and finished material, related rock and gem items; contact Carolyn DeMetz, (541) 267-5008; e-mail: czdemetz@earthlink.net.

20-21--CASTLE ROCK, WA: 38th annual show; Southern WA Mineralogical Society; adjacent to Cowlitz River; dealers, demonstrations, door prizes, country store; contact Vickie Johnson, 1574 Mount Pleasant Rd., Kelso, WA 98626-9214; e-mail: vickijrocks@msn.com.

20-21--PASO ROBLES, CA: 12th annual show, "Rockhound Roundup"; Santa Lucia Rockhounds, Pioneer Park and Museum, 2010 Riverside Ave; Sat. 10-6, Sun. 10-5; free admission; dealers, demonstrators, displays, kids' activities, silent auction; contact John McCabe, (805) 464-0528; e-mail: mccabewest@aol.com.

20-21--REDWOOD CITY, CA: 37th annual show, "Harvest of Gems"; Sequoia Gem & Mineral Society; Community Activities Bldg., 1400 Roosevelt Ave.; Sat. 10-5, Sun. 10-5; free admission; more than 30 displays of gems, minerals, jewelry and lapidary arts produced by local artists and collectors, live demonstrations of rock cutting, carving, bead making and silversmithing, gem, mineral and jewelry dealers, raffle, games for children, silent auction of rocks and rock cutting tools; contact Walter Skinner, (650) 589-3505.

26-28--TOOELE, UT Show, "Artistry of Gems"; Tooele Gem & Mineral Society; Tooele City Recreation Complex, 400 West 400 North; Fri. 10-8, Sat. 10-8, Sun. 10-5; free admission; dealers, displays, door prizes, in conjunction with the "Festival of the Old West" Mountain Man Rendezvous & Native American Pow Wow; contact Janit Nix, P.O. Box 348, Tooele, UT 84074, (435) 882-0458; e-mail: toolegem@netscape.net; Web site: www.utahrockhounds.com/tooelegem/showflier.html.

27--ALTOS, CA: Show, "Recreation with Rocks"; Peninsula Gem & Geology Society; Rancho Shopping Center, Foothill Expwy. and S. Springer Rd.; Sat. 9:30-4:45; free admission; contact Jo Burchard, (650) 493-9301; e-mail: jombur@msn.com.

27--MOUNTAIN HOME, ID: Show; Eureka Rock & Gem Club; Mountain Home Senior Center, 1000 N. 3rd E; Sat. 9-4; free admission; dealers, lectures, movies, raffle, demonstrations, silent auction, gold panning, junior activities, field trips; contact Margret Morgan, 2222 Bishop Rd., Emmett, ID 83647, (208) 365-1653.

27-28--DOWNEY, CA: Show, "Delver's Gem Show"; Delver's Gem & Mineral Society; Woman's Club of Downey, 9813 Paramount Blvd., one block north of Florence Ave.; Sat. 10-6, Sun. 10-4; free admission; contact Earl Liston, 11309 E. Felson, Cerritos, CA 90703, (562) 865-1348; e-mail: eliston@yahoo.com.

27-28--FONTANA, CA: 28th annual show; Kaiser Rock & Gem Club; CA Speedway, 9300 Cherry Ave.; Sat. 9-5, Sun. 9-5; free admission; contact JoAnn Watson, 8373 Redwood Ave., Fontana, CA 92335, (909) 355-7455; e-mail: kc6qcr@aol.com.

27-28--FRANKLIN, NJ: 47th annual show; Franklin Museum; Franklin School, WA Ave.; contact John Cianciulli, (973) 827-6671; e-mail: rockman@warwick.net.

27-28--MONTEREY, CA: 44th annual show; Carmel Valley Gem & Mineral Society; Monterey Fairgrounds, 2004 Fairgrounds Rd.; Sat. 10-6, Sun. 10-5; adults \$3.50, children free with adult; contact Sky Paxton, (831) 663-6978; e-mail: sky@familystones.net; or Janis Rovetti, (831) 657-1933, e-mail: jrrovetti@aol.com; Web site: www.cvgms.org.

