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and

PROCEEDINGS OF THE GEMMOLOGICAL ASSOCIATION OF GREAT BRITAIN

GEMMOLOGICAL ASSOCIATION
OF GREAT BRITAIN
SAINT DUNSTAN'S HOUSE, CAREY LANE
LONDON, E.C. 2

GEMMOLOGICAL ASSOCIATION OF GREAT BRITAIN

(Originally founded in 1908 as the Education Committee of the National Association of Goldsmiths, reconstituted in 1931 as the Gemmological Association)

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Sir William Bragg, O.M., K.B.E., F.R.S.
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SIXTY YEARS OF GEMMOLOGY IN GREAT BRITAIN

THE genesis of the educational scheme, initiated by the National Association of Goldsmiths of Great Britain and Ireland, the representative organization of the retail jewellery trade in Great Britain, which eventually culminated in the Gemmological Association of Great Britain, occurred at the annual conference of the National Association at Manchester on 6th July, 1908, when a resolution, moved by Mr. Samuel Barnett, advocating the formation of teaching courses and examination in gemmology was adopted.

Considerable difficulty was experienced at the outset in launching the scheme, not only on account of the general apathy in the jewellery trade but also because no suitable text-book was at that date available, and, moreover, because so many of the prospective students were widely scattered throughout the country. It called for two years of unremitting efforts before there was sufficient response from the jewellery trade to enable the scheme to proceed. However, interest was maintained by the lectures on gemmological subjects which were given in 1909. The difficulty of establishing contact with distant students was met by the correspondence course of general instruction for jewellers which Mr. Arthur Tremayne was conducting at that time. Further progress was made in the following year, 1910. Mr. Noel Heaton, B.Sc., was appointed Official Lecturer by the Egucation Committee, and

delivered several lectures at various centres in the Country; in consequence increasing interest was aroused in gemmology. A contributing factor was the growing use of the portable refractometer devised by Dr. G. F. Herbert Smith in 1906. Mr. Barnett, indeed, found that it was the invention of this simple, and easily handled instrument which did more than anything else to awaken the jewellery trade to the importance of the study of the characters of gemstones. Dr. Herbert Smith's book "Gemstones", published in 1912, set a standard of accuracy and scholarship that greatly assisted the teaching of gemmology. This classic work reached its thirteenth edition in 1958. Dr. Herbert Smith was appointed as principal examiner and at the same time Mr. Bristow J. Tully was appointed official instructor. Mr. Irvine G. Jardine prepared a correspondence course and eventually became lecturer at the first classes in gemmology at the Chelsea Polytechnic, London, with Mr. Thorold Jones as demonstrator.

As finally adopted, the scheme consisted of an advanced examination, the Diploma, and a much easier Preliminary examination. No essential change has been made in the character and standard of the examinations since the inauguration of the scheme, except for slight modification and widening of the syllabus. The standard set for the Diploma has always been high, and that for qualification with distinction, a variant introduced in 1922, is very high. It is probably this fact that accounts for the high reputation of the examinations not only at home but in other countries as well. The foundation of the scheme was, indeed, well and truly laid.

The first examination was held in 1913, and others followed in 1914 and 1915; but in consequence of the outbreak of the first world war the scheme became dormant. Indeed, it was not at first intended to hold an examination in 1915, but it was found that a few candidates were well advanced in their studies before the crisis developed, and would have been disappointed had there been no examination. Even when happier days returned the series was not resumed until 1922; but since then there has been no interruption in spite of the outbreak of the second world war and the venemous attacks by air upon the country, especially the heavy bombing of the London area. It cannot, indeed, be too strongly stressed how highly creditable it was to all concerned that in such difficult and unprecedented circumstances the classes and examinations were quietly continued without a break.

When the examinations were resumed in 1922 it was decided to divide the successful candidates for the Diploma into two classes: those whose work was on so high a plane as to warrant the award of distinction, and those who qualified at a lower level. To commemorate Mr. B. J. Tully and the eminent services that he had rendered to the examination scheme Mrs. Tully presented a set of dies for striking a medal to be awarded to the best candidate who sat for the Diploma examination in each year; the medal was first awarded in 1930. Subsequently Messrs. Rayner & Keeler Limited of London, kindly made available to the Association an annual award of gem-testing instruments in connection with both preliminary and diploma examinations.

As a result of the enthusiasm and hard work of Fellows various classes in gemmology became established in provincial cities, under the aegis of education authorities.

To meet the needs of students living overseas, the Associateship examination, consisting of the Diploma theoretical papers only, was instituted in 1938. Successful candidates could qualify for the Diploma by passing the practical test at a subsequent examination in London, and several soon took successful advantage of this arrangement. It has, however, been found possible to hold a practical examination at certain centres overseas, and the Associate examination was discontinued in 1950.

With a view to encouraging and recognizing postgraduate study by Fellows the Council instituted in 1945 the Research Diploma. It is awarded for an authorized thesis of adequate quality.

From 1946 until 1950 a prize, donated by Mr. B. W. Anderson was awarded for outstanding work in the practical section of the diploma examination.

The formal inauguration of the Gemmological Association as a branch of the National Association took place at the annual distribution of awards in October of 1931. Holders of diplomas became eligible for election to fellowship with the right to add the letters F.G.A. to their names. In 1938 greater precision was given to the title of the new body by the adoption of the form: Gemmological Association of Great Britain. The final stage was reached on 14th April, 1947, when the Association was incorporated. The Association is an independent entity; but its origin from the National Association of Goldsmiths and the support that it received

and continues to receive from the latter is not and will not be forgotten. The National Association of Goldsmiths continues to provide the clerical assistance needed for the day-to-day work of the Association, and the close links between the two organizations have been an important factor in increasing interest in gemmological studies.

The Association receives entrants for its examination from students all over the world, apart from the U.K., who have studied gemmology at classes or courses arranged by gemmological organizations or under the aegis of local education authorities. The only courses conducted by the Association itself are those by correspondence, to cater for those who have not facilities for attending local classes.

The first official journal of the Association was *The Gemmologist*, in 1931. Subsequently, in 1935, the official publication was *Gemmological News*, which changed its title to that of *The Journal of Gemmology* in 1944. Until the date of incorporation of the Association reliance was placed upon outside publishers for an official publication but upon incorporation in 1947 direct responsibility for publication was undertaken and has been retained since that time. In 1947 it was decided to appoint a Curator of the Association's collection of gemstones.

The first President was Sir Henry A. Miers, who held office from 1932 until 1937. He was succeeded by Sir William H. Bragg, and on the latter's death in 1942, Dr. G. F. Herbert Smith was elected to the office and served until his death in 1953. He was succeeded by Sir Lawrence Bragg, the son of the second President.

The Herbert Smith Memorial Lectures were instituted in 1955, in memory of one who had done so much for gemmology and the Association. Likewise Sir James Walton, the first Curator, was remembered when the National Association of Goldsmiths joined with the Association in establishing a library in his memory.

Three branch associations were formed in 1952 based in the midlands and the east and west of Scotland. The East of Scotland Branch ceased in 1955 and members in the area took part in meetings arranged by the western branch, which, in 1967, changed its title to that of Scottish Branch. The work of the branches has been invaluable in furthering interest in gemmology.

From 1966 the registrar of the National Association of Goldsmiths has assisted with the increased education work connected

with gemmology and the larger number of entries for the examinations.

The Association has assisted in the formation of various gemmological organizations overseas and close contact is maintained between these and similar associations on all matters apertaining to the study of gemmology.

In 1961 the Association was asked by Rayner & Keeler Limited to take over the retail sales of their gemmological instruments. The arrangement has been mutually beneficial and the Association is indebted to Rayner & Keeler for their continued co-operation with the Association. In order not to disturb the permission given to the Association to omit the word "Limited" from its title, a separate sompany was formed to handle sales.

Apart from those who pioneered the study of gemmology the Association has been fortunate over the years in having had assistance from various other eminent and enthusiastic workers. These include Mr. F. H. Knowles-Brown, who served as Chairman for almost twenty years, and Mr. B. W. Anderson whose work both as a lecturer and as an examiner, has been invaluable. Also there is Mr. R. Webster to whom the Association is indebted, and Dr. G. F. Claringbull, who has served as an examiner since 1938. To many other gemmologists in Great Britain and overseas the Association owes a debt of gratitude. Mr. Norman Harper, the present Chairman, initiated and for some time conducted the first courses devoted to the study of gem diamonds, and this has given to the educational work of the Gemmological Association an added dimension. The Association became the examining body and issues a certificate to Fellows who qualify.

In sixty years, as a result of the enthusiasm of many who have been devoted to the furtherance of the study of gemmology, much has been achieved in Great Britain and overseas and the National Association of Goldsmiths can look back with satisfaction at the splendid work that has stemmed from the resolution passed at its conference in July, 1908.

Details of the officers, administration and examination results, are set out in the following pages.

OFFICERS AND ADMINISTRATION 1908-1968

(i) President

1932-37 Sir Henry A. Miers, D.Sc., F.R.S.
1937-42 Sir William H. Bragg, O.M., K.B.E., D.Sc., F.R.S.
1942-53 G. F. Herbert Smith, C.B.E., M.A., D.Sc.
1954- Sir Lawrence Bragg, C.H., O.B.E., M.C., B.Sc., F.R.S.

(ii) Chairman

(*a*) Education or Gemmological Committee

1908-12 S. Barnett.
1912-27 G. H. Clapham.
1928-29 C. E. Parsons.
1929 B. J. Tully.
1929-30 G. Tarratt.
1930-31 S. Barnett, F.G.A.

(*b*) Council of the Association

1931-32 S. Barnett.
1932-35 A. Greenslade.
1935-42 E. A. Dodd.
1942-46 V. W. Clarke, Hon. F.G.A.
1946-55 F. H. Knowles-Brown. F.G.A.
1955 Sir James Walton, K.C.V.O., B.Sc., M.S., M.B., F.R.C.S., F.G.A.
1955-65 F. H. Knowles-Brown, F.G.A.
1965- N. A. Harper, F.G.A.

(iii) Honorary Treasurer

1912-15 J. Dyson.
1924-25 V. W. Clarke.
1926-31 A. W. Boatman.
1932-42 V. W. Clarke.
1942-47 J. H. Stanley, F.G.A.
1947-51 S. F. Bones, F.G.A.
1951- F. E. Lawson Clarke, F.G.A.

(iv) Honorary Secretary

1908-12 S. Barnett.
1931-33 A. Tremayne.
1933 S. T. Solomon, F.G.A.
1933-38 F. E. Leak, F.G.A.
1938-39 G. F. Andrews, F.G.A.
The office then lapsed.

(v) Curator

1947-55 Sir James Walton, K.C.V.O.
1955-57 G. M. Sprague, M.B.E., F.G.A.
1957- R. Webster, F.G.A.

(vi) Librarian

1947- H. J. B. Wheeler, F.G.A.

(vii) Registrar

1966 A. Roebuck.
1967- Miss J. Burgess.

(viii) Secretary

1912-26 C. L. Burnett.
1927-32 Miss E. Pettifer.
1933-39 E. Trillwood, F.G.A.
1939- G. F. Andrews.

EXAMINATIONS

(i) Examiners

1931-51 G. F. Herbert Smith, M.A., D.Sc.
1913-23 E. Hopkins.
1924-28 B. J. Tully.
1929-37 A. H. Ward.
1938- G. F. Claringbull, B.Sc., Ph.D., F.G.S.
1951- B. W. Anderson, B.Sc., F.G.A.
1955- J. R. H. Chisholm, M.A., F.G.A.
1964- A. J. Allnut, B.Sc., Ph.D., F.G.A.
1963- S. Tolansky, Ph.D., D.Sc., F.R.S.

(ii) Director of Examinations

1913-15 W. A. Steward.
1922-23 B. J. Tully.
1924-26 C. L. Burnett.
1927-29 R. Sawers.
1929-32 A. H. Ward.
1932-33 C. L. Burnett.
1934-38 E. Trillwood.
1939- G. F. Andrews.

(iii) Research Diploma

1945	M. D. S. Lewis, B.Sc.
1946	R. Webster.
1953	G. F. Leechman.
1957	E. Gubelin, Ph.D.
1959	L. C. Trumper, B.Sc.

(iv) Diploma Examination

(*a*) Candidates

	Entered	Qualified
1913	8	6
1914	6	5
1915	2	2

From 1922 the successful candidates were divided into two grades: Distinguished and Qualified.

	Entered	Distinguished	Qualified
1922	8	3	4
1923	13	2	8
1924	20	4	13
1925	18	3	10
1926	19	3	11
1927	20	7	10
1928	15	4	10
1929	25	5	18
1930	18	6	7
1931	22	7	10
1932	23	4	11
1933	28	9	18
1934	21	9	12
1935	14	7	7
1936	17	2	8
1937	25	10	14
1938	30	8	18
1939	23	7	8
1940	10	1	5
1941	3	2	1
1942	7	4	1
1943	4	2	1
1944	11	2	2
1945	24	5	8
1946	17	7	8

1947	...	...	...	28	...	11	...	10
1948	...	...	...	95	...	9	...	51
1949	...	...	...	104	...	21	...	60
1950	...	...	...	96	...	12	...	59
1951	...	...	...	92	...	16	...	56
1952	...	...	...	101	...	13	...	32
1953	...	...	...	99	...	9	...	39
1954	...	...	...	75	...	13	...	18
1955	...	...	...	84	...	10	...	44
1956	...	...	...	93	...	9	...	52
1957	...	...	...	100	...	6	...	34
1958	...	...	...	100	...	7	...	51
1959	...	...	...	60	...	7	...	41
1960	...	...	...	110	...	13	...	44
1961	...	...	...	106	...	14	...	51
1962	...	...	...	135	...	18	...	71
1963	...	...	...	132	...	20	...	59
1964	...	...	...	139	...	...4	...	44
1965	...	...	...	176	...	10	...	82
1966	...	...	...	194	...	13	...	70
1967	...	...	...	196	...	11	...	79

(*b*) **Tully Medallist**

1930 C. M. L. CARR, London.
1931 G. F. ANDREWS, London.
1932 F. E. LEAK, London.
1933 E. H. NEALE, London.
1934 R. K. MITCHELL, London.
1935 H. E. TILLANDER, Helsinki, Finland.
1936 H. E. SMITH, Brighton.
1937 J. N. WATSON, Glasgow.
1938 J. VINCENT, Brighton.
1939 A. P. AMBROSE, London.
S. H. ROSS, London.
1940 W. H. WEST, London.
1941 G. F. N. MARRIOTT, London.
1942 M. HENDERSON (Miss), Dundee.
1943 B. A. MACLEAN (Mrs.), London.
1944 M. D. S. LEWIS, London.
1945 G. I. PARRY (Mrs.), Cardiff.
1946 A. S. BRAUNFELD, London.
E. R. LEVETT, London.
1947 E. H. RUTLAND, London.
G. M. SPRAGUE, Edinburgh.
1948 No Award.

1949 P. J. THOMSON, Thundersley.
1950 H. L. ZWIRS, Netherlands.
1951 J. D. WADE, Glasgow.
1952 L. SIEDLE, Colombo.
1953 J. B. KEMP, Bristol.
1954 N. DEANE, Wednesbury.
1955 R. E. MUIR. Wilmslow.
1956 P. G. MARKS, Sydney.
1957 No Award.
1958 J. G. ROACH, Birkenhead
1959 No Award.
1960 H. S. HEIKKILA, Helsinki, Finland.
1961 L. WELLINGTON, Scarbough, Canada.
1962 P. A. WATERS, Manchester.
1963 G. V. AXON, New York, U.S.A.
1964 F. G. DOWIE, Christ Church, New Zealand.
1965 C.CANNAWURF (Miss), Frankfurt. W. Germany.
A. TAYLOR, Exeter.
1966 B. F. MARTIN, Sheffield.
1967 E. STRACK (Miss), Idar-Oberstein, W. Germany.

The Tully Medallists are included among the candidates who gained distinction.

(v) Associate Examination

	Entered	Passed
1941	3 ...	3
1944	1 ...	1
1945	1 ...	—
1947	1 ...	—
1948	6 ...	4
1949	7 ...	3
1950	2 ...	2

This examination was discontinued in 1950.

(vi) Preliminary Examination

(*a*) Candidates

	Entered	Qualified
1913	12 ...	7
1914	15 ...	12
1915	1 ...	1
——	— ...	—
1922	35 ...	26
1923	28 ...	24
1924	33 ...	26

1925	...	...	...	27	...	22
1926	...	...	...	33	...	26
1927	...	...	...	35	...	25
1928	...	...	...	37	...	31
1929	...	...	...	30	...	28
1930	...	...	...	32	...	28
1931	...	...	...	28	...	24
1932	...	...	...	29	...	26
1933	...	...	...	31	...	29
1934	...	...	...	24	...	22
1935	...	...	...	25	...	24
1936	...	...	...	32	...	31
1937	...	...	...	39	...	32
1938	...	...	...	37	...	33
1939	...	...	...	29	...	24
1940	...	...	...	11	...	9
1941	...	...	...	5	...	4
1942	...	...	...	16	...	6
1943	...	...	...	17	...	15
1944	...	...	...	21	...	14
1945	...	...	...	24	...	17
1946	...	...	...	28	...	23
1947	...	...	...	139	...	113
1948	...	...	...	176	...	143
1949	...	...	...	126	...	85
1950	...	...	...	139	...	96
1951	...	...	...	147	...	117
1952	...	...	...	134	...	50
1953	...	...	...	124	...	62
1954	...	...	...	137	...	83
1955	...	...	...	148	...	100
1956	...	...	...	142	...	90
1957	...	...	...	130	...	81
1958	...	...	...	138	...	73
1959	...	...	...	183	...	102
1960	...	...	...	185	...	105
1961	...	...	...	182	...	123
1962	...	...	...	213	...	119
1963	...	...	...	215	...	112
1964	...	...	...	273	...	176
1965	...	...	...	265	...	169
1966	...	...	...	308	...	217
1967	...	...	...	376	...	232

(*b*) **Rayner Prize**

1938	S. H. Ross.	1953	N. Deane.
1939	No Award.	1954	R. E. Muir.
1940	H. R. Cox.	1955	M. S. D'Arcy.
1941	E. G. Mould.	1956	J. A. Jank
1942	R. W. Hester.	1957	I. N. Steadman.
1943	L. Walford.	1958	M. Mendelsohn.
1944	D. P. Guest.	1959	P. W. T. Riley.
1945	E. R. Levett.	1960	D. Hayes.
1946	No Award.	1961	E. W. Penner.
1947	H. P. Bowen-Evans.	1962	A. Cooper.
1948	E. H. Gudridge.	1963	M. Davies, Mrs.
1949	S. G. Warnes, Miss.	1964	F. Riding.
1950	I. N. Instone.	1965	S. Heffernan, Miss
1951	C. I. Belcher.	1966	E. Strack, Miss
1952	T. M. Brook.	1967	No Award.

(**vii**) **Honorary Fellowship**

1938	Prof. K. Schlossmacher.
	G. Gobel.
1938	Victor W. Clarke.
1946	G. F. Herbert Smith, M.A., D.Sc.
	G. F. Claringbull, Ph.D.
1947	W. F. P. McLintock, D.Sc.
	W. Campbell Smith, Sc.D.

(**viii**) **Official Journal**

1931-1934	The Gemmologist (N.A.G. Press Ltd.)
1935-1944	Gemmological News (Heywood & Co. Ltd.)
1945-1946	Journal of Gemmology (Heywood & Co. Ltd.)
1947-	Journal of Gemmology (Gemmological Association)

THE SAXON FIFTY-CARAT DIAMOND

A MODIFIED "PERUZZI"

By H. TILLANDER

DESCRIPTIONS and analyses of historical diamonds have so far mainly been concerned with popular and mythological aspects and in very few instances give accurate and detailed descriptions of the ingenious architecture of the predominant masterpieces among these diamonds.

The aim of this report is to fill this gap and is a part of a series started with descriptions of the "Ideal Peruzzi-cut", as well as the Wittelsbach and Regent diamonds. ("Six Centuries of Diamond Designs"—*Journal of Gemmology*, Vol. IX, No. 11, July, 1965).

The Dresden (or Saxon) White is exhibited in the "Green Vault" of Dresden. It is set in a large shoulder knot (épaulette), the height of this page (8½ of an inch). There is no certain evidence of the origin of this diamond, but according to very detailed investigations by such authorities as Erna von Watzdorf and others it must have been acquired by king Augustus III (Elector of Saxony as Frederick Augustus II) and originally set by Andreas Jacob Pallard, a native of Geneva, who worked as court jeweller in Dresden between 1746-49, then in 1753 and again around 1756. His first assignment seems to have been the remodelling of a Golden Fleece into which the Dresden Green originally had been set and the shaping of this magnificent piece of jewellery would best fit into this same period. Theoretically Pallard may of course have fulfilled his assignment in his Viennese workshop or when he was back again in Dresden in 1753—in that case perhaps the reason for calling him back, but these alternatives are unprecedented. In any case the year 1753 must be the ultimate date, since disastrous wars and consequent poverty followed in 1754. And in 1768, not too long after the Seven Years War, the jewel was transformed by another craftsman, Diesbach. This resulted in a mixture of different styles, not only in design, but also with respect to the diamond cluster of the shoulder knot. The photograph, Figure 1, shows only the original part of the jewel, the Saxon gem in the centre.

The Saxon diamond is a squarish, elongated brilliant-cut stone, very much resembling the "Peruzzi-cut", with overall dimensions of 26 × 23 millimeters, illustrated in correct size and

shadowed in the diagram for easier interpretation of its actual shape.

The pavilion is different with respect to the rectangular shape of its culet (4 × 2 mm) and the narrower main facets (the bottom corners) are therefore foursided kites, touching the culet at its corners.

The design of the crown shows an elongated octagon (18,5 × 15,6 mm) which in a normal brilliant-cut would be the table. In this diamond, however, the octagon forms the base of a truncated, extremely flat solid, with four pentagonal faces and a rectangular vertex, which is the table. The height of the superimposed solid is only one third of a millimeter and the unique rectangular table measures 6,6 × 5,0 mm. The inclination towards the girdle plane of the longer pair of faces is 4°, of the adjacent top main facets (quoins) 44°, and of the corresponding pavilion main facets (quoins) $33\frac{1}{2}°$. It is thus a brilliant-cut diamond with ideal 18th (and 19th) century crown angles, but much too narrow pavilion angles. In case the cutter had applied a table face in the normal way, this would have been very large, resulting in a less attractive stone. The four pentagonal apex facets, through which much of the light enters the stone, cause through their inclination slight changes with the path of light and probably improve the brilliancy of the diamond to some extent. Light entering the faces around the rectangular table actually strike the largest two pavilion facets as if their angle was $33{,}5 + 4° = 37{\cdot}5°$.

It is extremely difficult to judge the influence of proportions on the beauty of a large diamond, especially since the diamond is not displayed in the illumination for which it was intended—that of innumerous candles of chandeliers. Considering the fact that this stone must primarily have been cut for size, it can only be admired as a further example of exquisite workmanship and elegance well competing with the Wittelsbach and the Regent. Particularly striking is the beautifully balanced distribution of facets.

In subsequent reports other interesting diamonds will be analyzed.

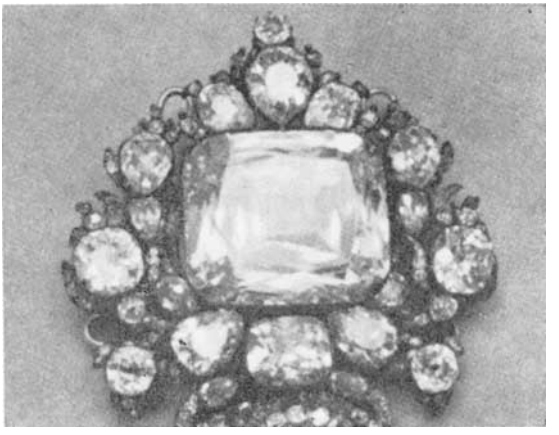
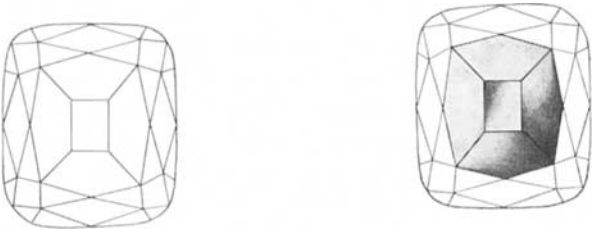


FIG. 1. *The only remaining part of Pallard's composition with the 49·71 cts Saxon White diamond. Actual size. (Green Vault, Dresden).*



a FIG. 2 *b*

FIG. 2A. *Top view of the Saxon White with 36 crown facets and a table.*

FIG. 2B. *Top view with the centre facets shaded.*

Size of stone 26,00 mm × 23,00 mm = 100%.
Size of octagon 18,75 mm × 15,60 mm = 68,5%.
Size of table 6,60 mm × 5,00 mm = 22%.

a FIG. 3 *b*

FIG 3A. *Side view, without girdle, which could not be measured because of the heavy setting.*

3B. *Same shadowed.*

Crown height	*0,35 mm*	= *1,5 %*	*Total depth*	*11,00 mm*	= *47,8 %*
	+ *3,65 mm*	= *15,9 %*	*Culet size*	*4 × 2 mm*	= *8,7 %*
	4,00 mm	= *17,4 %*	Angle of facets alongside table		*4°*
Pavilion depth	*7,00 mm*	= *30,4 %*	Angle of bezel facets		*44°*
			Angle of pavilion facets		*33° 30′*

PSEUDOCROCIDOLITE

By ROBERT WEBSTER

SOUTH AFRICA has one gemstone which can be said to be peculiarly its own; this is the silky golden-brown ornamental stone pseudocrocidolite, which is sometimes better known as 'tiger's-eye'. This stone is usually dealt with cursorily in gem literature and in this short article some attempt is made to amplify the knowledge of this attractive gemstone.

In a part of Northern Cape Province lies Griqualand West, an area which was the original territory of the Griquas, who were a coloured people of mixed ancestry and not necessarily indigenous to the country. The district of Griqualand West, which was incorporated into Cape Colony in 1871, of arid nature and bordering on to the Kalahari desert, is the area in which is found the blue asbestos called crocidolite. It is here that commercially exploitable deposits of this mineral are found in the banded ironstones of the Transvaal system of rocks, which, among others, form the Asbestos Mountains which run in a north-easterly direction from the Orange river.

Crocidolite asbestos is a hydrous silicate of sodium and iron. It is an amphibole of blue colour and is made up of silky fibrous monoclinic crystals which have a cleavage parallel to their length. The material may be said to be a fibrous variety of riebeckite. The unaltered mineral has a hardness of 4 on Mohs's scale, a density of about 3·3 and refractive indices of $\alpha = 1{\cdot}698$, $\beta = 1{\cdot}699$ and $\gamma = 1{\cdot}706$. The mineral shows a silky to dull lustre and the individual fibres are strongly pleochroic. Large deposits of this blue asbestos are found in South Africa, particularly around Prieska, but except for deposits in Australia, there are few of any size in other parts of the world. The commercial value of crocidolite asbestos lies in its resistance to chemical action, particularly by acids and by sea-water—hence its use as an insulator in marine engineering.

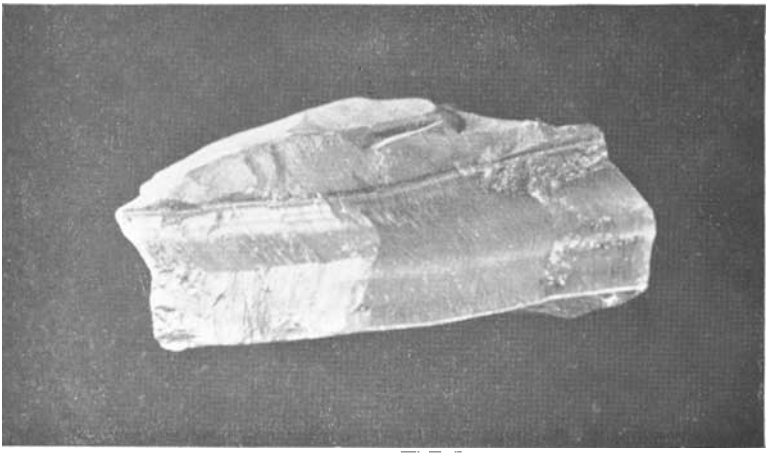
It is not, however, the mineral crocidolite which interests the gemmologist, but its silica pseudomorph. In an area north of Prieska, particularly near the village of Niekerkshoop, in Griqualand West, the crocidolite fibres have been altered by a gradual replacement by silica while retaining the general outward appearance of the original asbestos. This silification retains, too, the original

habit of the asbestos which had formed as parallel fibres stretching across a vein from wall to wall, producing the so-called "cross-fibre" asbestos. The veins are rarely more than a few centimetres in thickness and are in a finely grained quartz rock of reddish-brown, coffee-brown or ochre-yellow colour. The host rock, which may be compact or somewhat thinly bedded, may be described as a jasper-schist or an "ironstone."

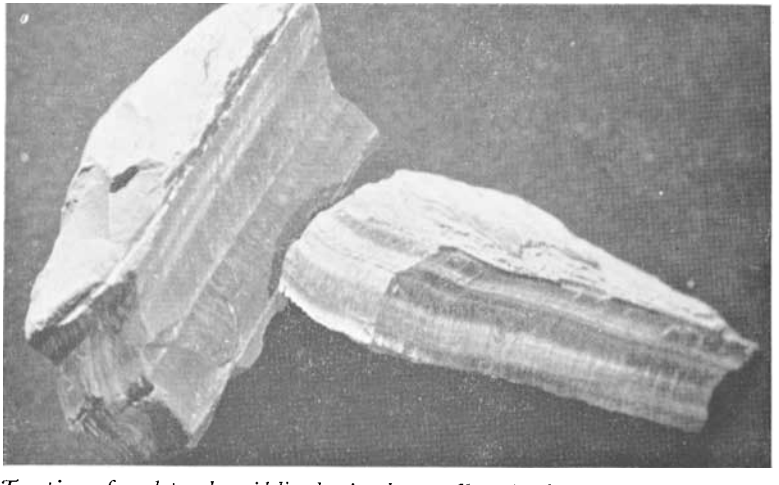
The original crocidolite is blue and when this is silicified the bluish stone is termed "hawk's-eye" (or sometimes "falcon's-eye") and such material is often cut and polished, or fashioned by the "tumbling" process, producing pleasing stones. Oxidation of the iron constituent of the crocidolite, which can occur either before or after silification, produces the lovely "tiger's-eye". A polished surface of pseudocrocidolite when turned towards the light often shows a series of lustrous bands alternating with bands of duller colour which show little silky lustre. The beauty of the effect is enhanced by the fact that the fibres are not always perfectly straight; they may be curved and often have a sharp bend or twist at a certain place. A change in the incident light results in a reversal of the conditions, the dark bands becoming lustrous and the lustrous bands becoming dark.

The date when "tiger's-eye" was first found is open to some conjecture. Hodgson states:— "the discovery of blue asbestos is attributed to a German geologist named Lichtenstein, who, at some time between 1803 and 1806, was travelling near Prieska in the Orange river valley in South Africa, came upon a mass of heavy asbestos which was lavender-blue in colour. The discovery appears to have been forgotten for many years, to be revived in 1891 by a diamond prospector whose attention had been drawn to the "blue-ground" at Prieska. Diamonds there were none, but it was due to De Beers Consolidated Mines, whose main interests lie in diamond mining, that a company was formed in 1893 to exploit these new deposits of blue asbestos". On the other hand Bauer seems to imply that "tiger's-eye" was known about 1870, when it was said to fetch about 25/- per carat. Wodiska, in his book, states that "'tiger's-eye' is well adapted to and has largely been used for carving cameos and intaglios. It was very popular from about the year 1880 to 1890 in the United States of America". From this it appears likely that "tiger's-eye" was used as a gem material before the mineral crocidolite was itself commercially mined.

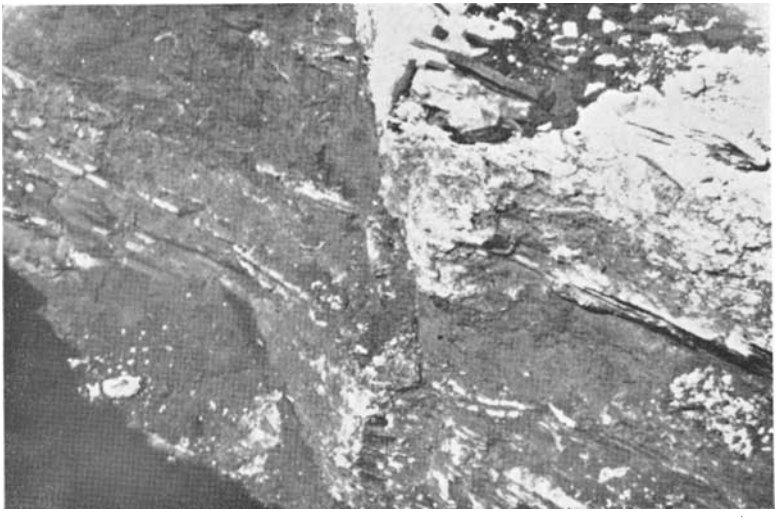
The pseudocrocidolite of South Africa is mined by cutting trenches across the terrain, a terrain which is semi-desert and lacks much in the way of flora except for sparsely distributed thorn bushes which have vicious thorns as much as two inches long. The trenches are cut down to some eight or ten feet through the banded ironstones, which are interspersed by parallel slabs of the pseudocrocidolite. When the writer visited the area during 1967 some of



Rough piece of "Tiger's-eye" showing the cross fibre vein in the ironstone host rock.



Two pieces of rough pseudocrocidolite showing the cross fibre vein of the silicified asbestos in the ironstone host rock.

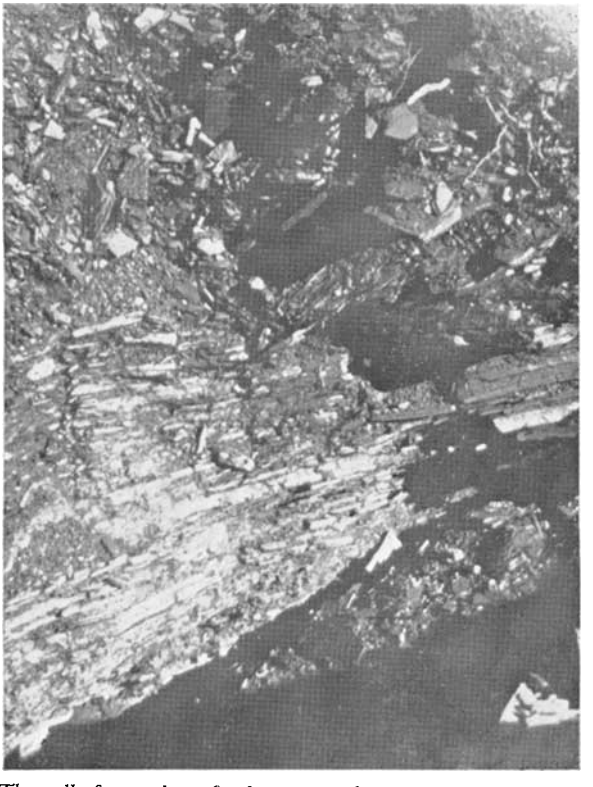


Wall of a trench cut for the recovery of pseudocrocidolite showing the layers of the mineral in the ironstone host rock. North of Prieska, Cape Province, South Africa.
Printed from a coloured transparency

these trenches, or pits, were seen to be undercut, and at one place the rock was being broken down by the "fire and quenching" method, and piles of the recovered mineral were stacked on the ground all around. Much of the recovery, after it has been sorted or graded, goes to Idar-Oberstein in Germany for fashioning and carving, but currently much is "tumbled" into baroque stones in South Africa, for mounting into jewellery for local and tourist needs.

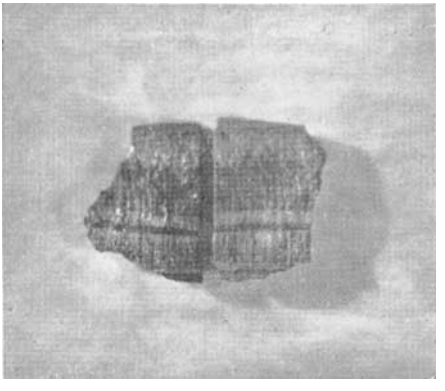
The fundamental colour of pseudocrocidolite is greyish-green to bluish-green and the name "hawk's-eye" is given to material of this colour. The most important variety is the golden yellow "tiger's-eye", which is the primary mineral altered in colour by oxidation of the iron content. However, there are other varieties, such as the variegated material yellow and greenish-blue which is called "zebra", and the bluish and greenish yellow stones termed "cat's-eyes". The term "wolf's-eye" or "wolf's-eye stone" is an unnecessary name for an intermediate colour between "hawk's-eye" and "tiger's-eye".

A red variety goes under the name of "bull's-eye" and the colour of this material is induced by heating. It is suggested that there is an alteration of goethite, or limonite, to hematite by loss of water to account for the colour change. It is conjectural whether this red-coloured material may be caused by the fire and water technique used in breaking through the rock, but undoubtedly most of this material is artificially treated. It may be significant that the writer saw no red material in the piles of recovered pseudocrocidolite. Experiment has shown that heating to a temperature of 250°C for thirty minutes turned a specimen of "tiger's-eye" to a red colour, and, further, heating to 450°C, and at 800°C, gave no improvement on the colour change. The bluish "hawk's-eye" did not appear to respond so readily to colour change by heat-treatment as did the golden "tiger's-eye" material.

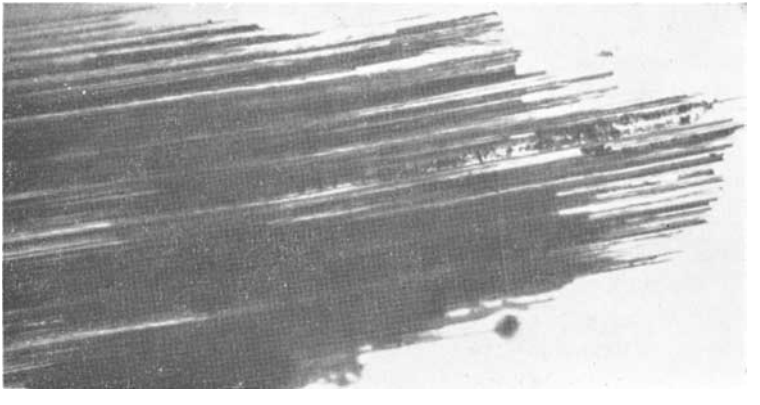


The wall of a trench cut for the recovery of pseudocrocidolite, showing the mineral in layers in the iron-stone host rock.
(Reprinted from a coloured transparency)

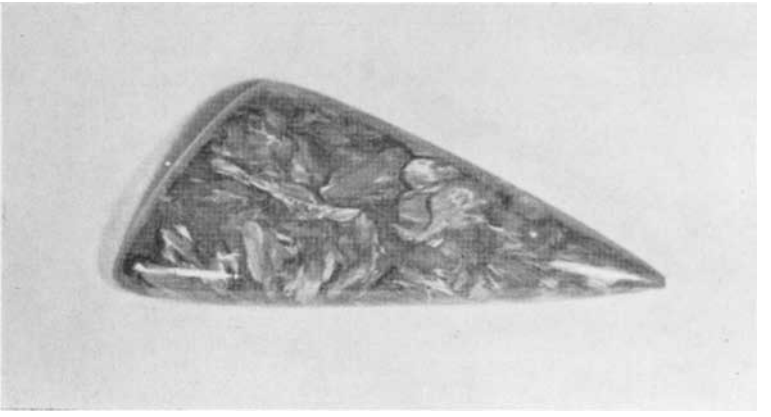
"Tiger's-eye", when treated with hydrochloric acid, is said to bleach to some extent, and this bleached material when fashioned into cabochon cut stones produces a pale yellowish chatoyant stone. This bleaching with hydrochloric acid does not appear to be readily achieved, for boiling a piece of "tiger's-eye" in hydrochloric acid did not seem to make any appreciable difference to the colour. It may well be that some considerable time is needed for the change to be brought about. The bleached material is sold under the name of "quartz". It appears that many pseudocrocidolite cabochons are stained—vivid greens, blues and blacks, which are obviously stained, have been seen. This staining may be carried out in a similar manner to that used for staining agates.



A piece of pseudocrocidolite ("Tiger's-eye") broken in two and the piece on the left heated to 250°C to turn it red.



Photomicrograph of a sliver of pseudocrocidolite



Silicified riebeckite ("*Pietersite*").

Examination of the properties of pseudocrocidolite showed the hardness to be perhaps a little below 7 on Mohs's scale, for a rock crystal tended to just scratch a polished piece of "tiger's-eye", and the density, taken on 15 specimens, varied from 2·64 to 2·71. The refractive indices were found to be $\omega = 1{\cdot}544$ and $\varepsilon = 1{\cdot}553$, with a bi-refringence of 0·009, values which agree with crystal quartz. It was observed that the direction of single refraction was at right angles to the direction of the asbestos fibres. Some confirmation of this was made when a sliver of "tiger's-eye" was viewed between crossed polars, and it was observed that extinction occurred at right angles to and parallel to the fibres of the original crocidolite. Microscopic examination of these fibres seemd to show that some of the fibres may be empty tubes but that some were filled with a dark material which may be goethite, limonite, or hematite. There was no convincing absorption spectrum to be seen in the natural colours of pseudocrocidolite, nor in the artificially coloured material, except for the green-stained stones, which showed the typical band in the orange-red part of the spectrum and possibly a weak band in the yellow to yellow-green, which is, or are, seen in several other green-stained materials such as the jadeites. No luminescence was observed under either wavelength of ultra-violet light or by x-ray bombardment, and there was no sign of any electro-conductivity.

Although crocidolite asbestos is simply a variety of riebeckite occurring in oriented silky fibres as "cross-fibre" veins, the name riebeckite is usually applied to the mineral when it is in disoriented masses. As a rule this material does not enter the realm of ornamentation, but as silicification of such material does occur it thus may be suitable for cutting and polishing. That this is so is exemplified by an occurrence of silicified riebeckite with limonite which is found in the neighbourhood of Outjo in South-west Africa. Attractive variegated golden-brown cabochons of this material have been prepared and marketed by Mr. S. Pieters a mineral dealer of Windhoek, who sells the finished product under the name pietersite. The density of one such piece was found to be about 2·6 and the Mohs's hardness to be similar to that found for "tiger's-eye". Another alteration product of crocidolite (riebeckite) consists of a mechanical mixture of silica and hydrated iron and has a hardness of 4 on Mohs's scale. This material has been named "griqualandite", but it has no place in our study and is only included in this survey for completeness. A chatoyant fibrous quartz has been obtained on the Cuyuna iron range of Minnesota in the United States of America. No opportunity to examine this material has presented itself.

Mention must be made of the so-called "Hungarian cat's-eyes". These yellowish-green chatoyant quartzes containing fibrous amphibole inclusions are obtained from the diabase of Hof and other places in the Fichtelgeberge in Bavaria. They do not come from Hungary. Such stones are inferior to the "cat's-eyes" found in India and Ceylon, and probably they are often artificially stained different colours.

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Gemmological Abstracts

MILES (E. R.). *South America and the world's diamond market.* Gems and Gemology, 1967/8, XII, 8, 226-238.

A review of the diamond production of Brazil, Guyana and Venezuela. 80% to 90% of Brazil's production is exported to Europe, Israel, Japan and India. The economics of diamond cutting in Brazil are discussed, the most popular styles of cutting being marquise and baguette. There is no stable demand for coloured diamonds. Some details of mining, the districts mined, and the geology of the areas, are given. There is much "local" information in this well-worth article.

9 illus. R.W.

LIDDICOAT (R. T.). *Developments and highlights at the Gem Trade Laboratory in Los Angeles.* Gems and Gemology, 1967/8, XII, 8, 247-253.

The results of the examination of a number of specimens of the new blue zoisite, and of the transparent green grossularite from Zambia, are given. Other items mentioned are carved iolites, oolitic opal, a glass assay button, a cut rhodochrosite, a cobalti-calcite, and a tourmaline which showed a slightly biaxial interference figure. An unusual "triplet" consisting of a sapphire cabochon on a base of faceted synthetic spinel is recorded.

15 illus. R.W.

ROLFF (A.). *First Brazilian Diamond Dredge.* Gems and Gemology, 1967/8, XII, 8, 239-241.

In 1966 mining by bucket dredge was commenced on the Jequitinhonha river. Something is told of the dredge used and of the recovery operations. The rate and quantity of diamonds recovered are mentioned. Very small diamonds, called "mosquito-eyes", are cut in Israel.

2 illus. R.W.

CROWNINGSHIELD (R.). *Developments and highlights at the Gem Trade Laboratory in New York.* Gems and Gemology, 1967/8, XII, 242-246 and 257.

Some comments are made on a synthetic emerald which may be of a new type, and on green tourmalines, which, it is suggested, are coloured by chromium and have emanated from Tanzania. Also mentioned are some brownish-purple garnets, which have low constants and are said to have come from a new locality in India. The features of massive lazulite, a faceted cuprite, dyed jadeite and Chatham and Gilson synthetic emeralds are discussed.
12 illus. R.W.

TOMBS (G. A.). *Handling and care of gemstones.* Australian Gemmologist, 1968, 10, 1, 18-19.

Describes the use and types of tongs best needed for the examination of different sized and shaped stones.

R.W.

SIEDLE (L. C.). *Three generations of gem merchants in Ceylon.* Australian Gemmologist, 1968, 10, 1, 7-16.

Strictly speaking this is a history of the Siedle family, but much useful information is given on the pearling and pearlers of Ceylon, and of the gem-dealing in that country.

R.W.

WEBSTER (R.). *"Fingerprinting" jewellery.* The Criminologist, 1968, 8, 44-56.

Describes the nature of an identity certificate for gemstones or jewellery so that they may be re-identified on recovery from loss or theft. A survey is given of the various methods proposed in order to compile such a certificate, and some evaluation is made of these various methods. It is inferred that a central registry is needed and there is a discussion on the economics of the problems of the production of such certificates.

P.B.

BOOK NOTICES

AXON (G. V.). *The wonderful world of gems.* Criterion Books, New York. 1967.

Written in popular style for general reading the book follows the more modern concept by first describing the formation of gems in the earth and the shapes (crystals) they form. This is followed by descriptions of the various gemstones, synthetic and imitation gems, and the organic materials used for ornamentation. The book continues with chapters on colour and inclusions in gems, curious tales of gems, the fashioning of gems, how to appraise them and how to identify them. There is no index, the book being completed with a glossary of terms. The book is adequately illustrated.

R.W.

PEARL (R. M.). *Gem identification simplified.* Maxwell Publishing Co., Colorado Springs. 1968.

A booklet of 43 pages intended to supply in compact form sufficient information for a jeweller, lapidary or gem collector to identify with some surety the more common gemstones, short notes of which are given. Simple methods of testing are described and prominence given to heavy liquid methods. The booklet concludes with tables of constants grouped under colours, translucent and opaque gems, and asteriated and chatoyant gems.

R.W.

IDRIESS (I.). *Opals and sapphires.* Angus & Robertson, London, 1968. 50s.

A guide to opal and sapphire mining in Australia, useful both to prospector and those who wish to have an interesting holiday. The author, who has prospected himself, writes entertainingly and covers the geological occurrence, mining, cutting and polishing of the gems. It is a pity that the outmoded term "oriental" has been used to describe the varieties of sapphire that have been found. There is a useful chapter giving the localities (with maps) in which sapphire has been found.

S.P.

SCHUBNEL (H-J.). *Pietre Preziose Gemme E Pietre Dure.* Ist. Geog. de Agostini, Novara, Italy, 1968. L.1,000.

This book is worthy of addition to any gemmological library for the interesting colour illustrations of gem crystals, gems and jewellery. There is a brief text, in Italian, dealing with the various gems and gems materials.

S.P.

HANSFORD (S. H.). *Chinese carved jades.* Faber & Faber, London, 1968. 5 gns. 8 plates in colour and 96 monochrome.

As one would expect from a Professor Emeritus of Chinese Art and Archaeology in the University of London, this is a scholarly work comparable to the author's *Chinese Jade Carving* (1950).

The present book is the result of painstaking research that have followed the earlier publication. Gemmologists will be interested in the chapter on the material and its sources. Here reference is made to the logic of Sir Charles Hardinge's reasoning concerning nomenclature and the unwillingness of mineralogists to disturb terminology which has stood the test of time. The archeaologist and art lover will find this book most rewarding.

B.J.

BOARDMAN (J.). *Engraved Gems.* The Ionides Collection. Thames & Hudson, London, 1968. 9 colour and 130 black and white illustrations. £5 5s.

A scholarly text dealing with the techniques, materials and the importance of gem-engraving in Greek and Roman times. Except for the use of the word "jacinth", the gemmological terms in the text are correct, and the author refers to the difficulty of identifying without proper apparatus some of the materials used for gem-carving. A book for the specialist interested in engraved gems.

S.P.

SCHUBNEL (H-J.). *Les pierres precieuses.* Presses Universitaires de France, Vendome, 1968.

A concise paper-back in the *que sais-je?* series of the publishers, and a useful introduction to gemmology and gemstones.

S.P.

CHALMERS (R. O.). *Australian rocks, minerals and gemstones.* Angus & Robertson, Sydney and London, 1967 (reprinted 1968). £5 7s. 6d.

The emphasis of this well written book is upon the rocks and minerals of Australia, rather than gemstones. There are detailed references to the many localities of Australian minerals and, although those of New South Wales receive particular attention, the book is a well balanced survey of the geology and occurrence of Australian minerals, with brief chapters on rock formation, crystallography and physical properties. The chapter on crystals is dealt with as simply as this complex subject can be, and the author writes of the rhombohedral or trigonal division of the hexagonal system, instead of treating the trigonal system separately. There are eight plates in colour and numerous photographs, those of geological features and mining scenes being of considerable interest.

S.P.

PERRY (N. & R.). *Australian gemstones in colour.* A. H. & A. W. Reed, Australia, 1967. 35AS. 3$ 50c.(Aust.).

Many of the colour photographs in this book were prepared by Nance Perry and are very good, but with a few the printing colour-registration is not up to standard. The test is simple and this book should be a useful introduction to all who are fascinated by the study of gemstones. In gathering together reliable material about gemstones of Australia and their localities the authors undertook many trips in order to check source material.

S.P.

AN ILLUMINATING DEVICE FOR EXAMINING GEMSTONES WITH THE SPECTROSCOPE

By B. F. MARTIN, M.D., B.Sc., F.G.A.

FOR those who do not possess one of the efficient but expensive high intensity lamps, designed to provide a small spot of intense light, there is difficulty in devising a means of illuminating gemstones adequately for spectroscopic examination.

An efficient general-purpose intensity lamp, of Japanese manufacture, is on the market at a low price (currently 50s.). This lamp, which is illustrated in Fig. 1, gives excellent lighting for general bench work, including refractometry and microscopy.

FIG. 1.

It has a flexible arm connecting the lamp hood to the base, which houses the transformer. Although supplied with a 12 volt, 6 watt bulb, which is quite adequate for general use, a bulb of higher wattage (e.g. 21 watt) can be used if stronger lighting is required.

Without some means of condensing the light, however, the lamp is not adequate for spectroscopy.

The author recently constructed a very simple piece of equipment which brings the lamp into use for spectroscopy. It is made from a short length of brass tubing, a bull's-eye lens and two strips of leather (Fig. 2). When required, it is inserted into the lamp hood as one inserts and twists tight a cork into a bottle. The only problem in constructing such a device is the acquisition of a suitable bull's-eye lens.

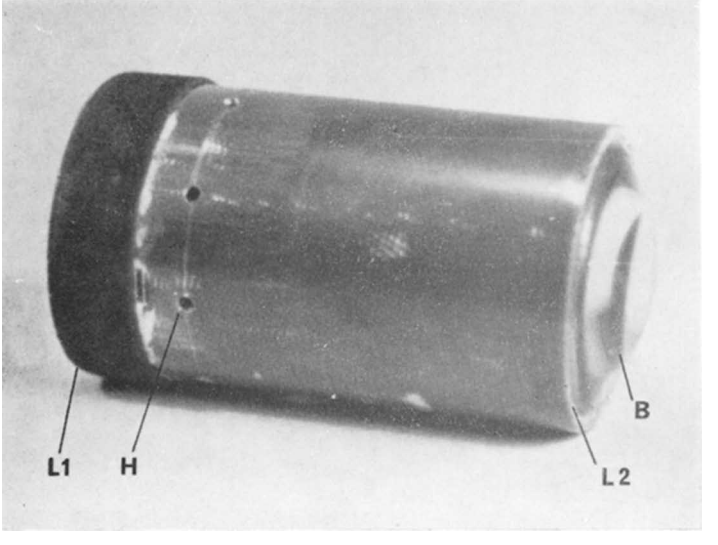

FIG. 2.

It will be noted from Fig. 1 that the lamp hood is funnel-shaped, which allows a tight grip to be obtained on the leather cuff attached to the end of the tube. The lamp hood aperture is $2\frac{3}{16}$ inches in diameter, so that 2 inch-diameter brass tubing, listed as 20 gauge (0·036 inch thickness; approximately $\frac{1}{32}$ inch) is ideal for the purpose.

To one end of the tube, a strip of thin, soft leather is attached with good contact adhesive, to form an external cuff (LI in Fig. 2). The strip needs to be about $6\frac{3}{4}$ inches long, to encircle the tube, and about $\frac{5}{8}$ inch wide. The rougher side of the leather is kept

outermost, to obtain a good friction in the lamp hood and the other side, as well as the adjacent part of the brass tube is roughened a little with a file, prior to applying the adhesive. About 1 inch from the same end of the tube, eight ventilating holes are drilled around the circumference with a $\frac{1}{8}$ inch or slightly smaller drill, and these serve to prevent over-heating (H in Fig. 2).

The bull's-eye lens is fixed into the opposite end of the tube (B in Fig. 2). The lens shown in the illustration was obtained from an old piece of optical equipment and was eminently suitable, since it was $1\frac{7}{8}$ inch in diameter, of short focal length ($2\frac{3}{4}$ inch) and already mounted in a thin brass collar. When held 3 inches in front of the lamp hood, it brought the bulb filament into focus, six inches beyond its own position. The brass tube was therefore cut to a length of $3\frac{1}{2}$ inches, to allow for about $\frac{1}{2}$ inch insertion distance into the lamp hood.

Since the diameter of the lens used was very little less than that of the tube, it was easily fixed in position by means of a strip of leather encircling the interior of the tube (L2 in Fig. 2). A strip of thick leather was cut, about $6\frac{1}{2}$ inches long and $\frac{1}{2}$ inch wide, and both surfaces were worn down with a rasp until the thickness was correct for holding the lens firmly in place. If a lens of smaller diameter were used, it would probably be necessary to fix it in some form of mount, to bring the diameter nearer to that of the tube. It must be emphasized, however, that the focus of the lens must be such that not too great a length of tubing is needed, otherwise the weight will overbalance the lamp. It is inadvisable to substitute plastic tubing for brass, in order to reduce weight, since it is prone to distortion under the heat of the lamp.

The device described has been used for two-hour periods of spectroscopy, using a 12 volt, 6 watt bulb and the results have been very satisfactory. It is shown in use in Fig. 1, with a stone illuminated on a Mitchell spectroscope stand, For those who prefer to hold the spectroscope in the hand, it is convenient to rest the stone on a small piece of coarse black cloth or felt, placed on top of the spectroscope case. The cloth can be kept in the case, together with the spectroscope.

ASSOCIATION NOTICES

ANNUAL GENERAL MEETING

The 38th Annual General Meeting of the Association was held at the Birmingham Conservative Club, Winston Churchill House, Ethel Street, Birmingham, on Wednesday, 3rd April. Mr. Norman Harper, Chairman, presided. It was the first occasion that an Annual Meeting had been held in Birmingham.

In moving the adoption of the Annual Report and Accounts, the Chairman said that the Association had had a busy, though routine year. During 1967 a grant of Armorial Bearings, had been received which was fully described in the July 1967 issue of the *Journal of Gemmology*. The report also drew attention to the continually increasing interest in our courses and examinations. In July 1968, sixty years of gemmology in Great Britain would be celebrated, with a Reception at Goldsmiths' Hall in November,.

The Chairman continued "Our history began on the 6th July, 1908 when at the Annual Conference of the National Association of Goldsmiths, Mr. Samuel Barnet of Peterborough proposed that the formation of teaching courses and arrangements for examinations in gemmology should be undertaken. At that time there was general apathy in the jewellery trade to the new subject of gemmology. It was a time when reconstructed and synthetic rubies had made their appearance on the market and it was imperative that the jewellery trade armed itself with techniques for distinguishing between natural and man-made stones. In 1906 Dr. Herbert Smith devised his portable refractometer, which proved a great boon to the jeweller, and in 1912 his classic work "Gemstones", which is still currently produced in revised form, was published. This set a standard of accuracy and scholarship which has stood the test of years. The first examinations were held in 1913 when twelve candidates entered for the preliminary and eight entered for the diploma. In 1967, 376 candidates sat for the preliminary and 196 for the diploma, 472 in all. The Association can look back with pride and satisfaction on its achievements since it was incorporated as a separate entity in 1947 and also look back with gratitude to the help that it has received from the National Association of Goldsmiths, whose Gemmological Committee was responsible for furthering the advance of gemmology in the United Kingdom.

Some famous names which stand out in our records include Mr. Samuel Barnet, who moved the resolution at the N.A.G. Conference in 1908, and who himself was a successful candidate in the first examination in 1913. Mr. Noel Heaton, the first lecturer, and Mr. B. J. Tully, who was the first official instructor and whose memory is constantly refreshed by the Tully Medal. Then there was Mr. Irving Jardine who wrote the first correspondence course.

Many of us will remember with affection the Chelsea Polytechnic which was the home of gemmology teaching for so many years and our great debt of gratitude to those whose teaching there and published works gave such a cachet to British gemmology, in particular Mr. Basil Anderson and Mr. Robert Webster. We remember Mr. F. H. Knowles-Brown, who was our Chairman for many years and who served us so well and Sir James Walton who was our Chairman for so short a period, but in whose memory a library was founded. We have had four Presidents of rare distinction in Sir Henry Miers, Sir William Bragg, Dr. Herbert Smith and our present President, Sir Lawrence Bragg. To these and many others we are extremely indebted.

We have maintained contact with gemmological organizations throughout the world and have been pleased to watch and frequently help in their formation. The National Association of Goldsmiths started it all and I would like to record and to convey to that organization our thanks for all that they have done and are continuing to do to assist in furthering the study of gemmology".

Mr. D. N. King, in moving the adoption of the report and accounts, pointed out that the annual subscription had remained at £2 2s. 0d. since 1959, and this was creditable to those responsible for the accounts. He also mentioned the high number of examination entries, particularly from overseas candidates, and emphasized the problems in accommodating the entrants at centres in various parts of the world. He also referred to the contacts which the Association had with gemmological organizations in other countries. Mr. King also said that the Association was indebted to Mr. Norman Harper for initiating the Gem Diamond Examinations.

Sir Lawrence Bragg was re-elected as President and the other Officers were also re-elected, namely Mr. Norman Harper, Chairman, Mr. Philip Riley, Vice-Chairman, and Mr. F. E. Lawson Clarke, Treasurer. Messrs. Watson Collin & Co., Chartered Accountants, continue as auditors to the Association.

SCOTTISH BRANCH

In commenting upon the work of the year, the Chairman recalled the excellent summer outing of the Branch to Arran. Later in the year Mr. N. Harper gave a talk on diamonds which attracted a record attendance of 135. There was a well patronized and rewarding evening spent at the Huntarian Museum. Mr. McWilliam commented upon the difficulty of finding suitable speakers. Some talks tended to be too technical, while others were not technical or instructive enough to attract large audiences.

The following Officers were elected for the ensuing year.

Chairman	—	Mr. J. McWilliam
Vice-Chairman	—	Mr. J. Gillougley
Secretary	—	Mr. D. Hill

Messrs. Inglis, McKenzie, McRae, Neil, Turner and Wade were elected to serve on the Branch Committee.

Following the election of Officers, the Branch considered the problems in connexion with establishing a Gem Diamond Course with a view to preparing candidates for the Gem Diamond Examinations of the Association. It was agreed to discuss the possibilities of suitable accommodation with the Glasgow Further

Education Department. After the meeting, two films were shown, "Diamonds" and "Making of a Jewel". Mr. James Gillougley proposed a vote of thanks to the Chairman and Secretary for their outstanding work during the year.

GIFTS TO THE ASSOCIATION

The Council has received for the Sir James Walton Library *Les Pierres Precieuses* and *Pietre Preziose—Gemme e pietre dure* from the author, Henri-Jean Schubnel, of Paris.

The Association is indebted to Mr. J. R. Fuhrbach of Texas for a collection of gemstones for student teaching purposes.

WANTED

Copies of *Jade of the Maori* by Elsie Ruff, published 1950.

MEMBERS' MEETING

Three speakers made up the programme of the meeting held on 20th March, 1968, at Goldsmiths' Hall, London, and it was one which members evidently found attractive, with about 100 being present.

They heard Dr. E. Rutland talking about the highlights of the gemstones at the Geological Museum, about which, despite the short time he has been there, he already possesses a wide knowledge; Dr. W. G. Cross showed by the examples of the fine work he has done just what the gemmologist-craftsman can attain by ingenious methods; and Mr. B. W. Anderson reminded his audience of the long list of new gemstones that have been discovered during the past century.

Dr. Rutland pointed out that the Geological Museum could boast its own collection of gem material going back to its foundation 130 years ago. The idea of the museum was to show the practical uses of minerals to man.

Dating from its earliest specimens was a magnificent carved fluorite some 30 inches high. A lathe had been used to do this work which he doubted was ever done today. There were plates and cups made of this material. They were, perhaps, the most remarkable examples in existence of native ornamental minerals.

The museum went in for what he called "jumbo" exhibits because of its very nature and gem stones were among these. They had large jadeite and nephrite boulders and carvings, and a topaz "boulder" weighing 30 lbs.

This jumbo size applied even to cut stones, the largest they possessed being a step-cut topaz of nearly 3,000 cts., of a fine greenish-blue colour; there was an exquisite kunzite of 425 cts. of a rich pink, a step-cut peridot of 136 cts., a cat's-eye of 77 cts. and a good collection of zircons of all colours.

They had also among smaller stones a good collection given them by a noted member, the late Mr. B. J. Tully.

Dr. Cross had brought his specimens with him and they showed that an enthusiast like himself can evolve ingenious methods to carve jadeite and nephrite. He passed round a bowl that he had made and a small gold mounted box together with a frog made from one of the square pieces and a white jadeite horse on a base of black nephrite.

To give an idea of his methods, he described how he had made the bowl from a block of nephrite about 5½ inches square and two inches deep. To conserve as much of the material as possible for use in the making of rings and bracelet parts, he excavated the centre by use of tube drilling. A number of different sized copper tubes were used for this, their ends prepared and impregnated with abrasive. Thereby he was able to draw their cores for later use. Similarly, he roughly shaped the exterior of the block with a hack-saw, giving himself further raw material. Many of his tools were adapted from those used by dentists.

Mr. B. W. Anderson reminded his audience that though many new minerals had been discovered in the last century, some were very scarce and therefore mainly of interest to the gemmologist.

In contrast, a new gem stone did not necessarily mean a new mineral species. It could be a new colour variety of attractive new form of a long established mineral.

Thus though some eight or nine entirely new gem species had been discovered, they had made no impact on the trade, including such scarce and few specimens as taffeite and painite, though the former—like sinhalite—had been found as cut gem stones before being discovered in the rough state.

The earliest new material discovered in the past 100 years was demantoid or green garnet in 1878. At first this was considered to be olivine but it was now well established and prized for its true worth.

Hiddenite and beryllonite were also discovered in the last century, with kunzite as the first to be found in the 20th century.

Often these discoveries were made partly by chance when somebody thought there was something odd about a stone and sometimes it was the expert rather than the original finder who gained most of the credit.

Benitoite was cut like a sapphire and had been on the market for some time before it was identified. It was unfortunate that this gem occurred only in one locality and, this being almost exhausted, few more would appear unless they were discovered elsewhere.

Among new gem materials which were not necessarily new minerals was the transparent grossular jadeite, which filled in an opening in the jadeite range.

The latest discovery was of blue zoisite from Tanzania, a really fine blue stone, transparent and clear, which, if enough was available, should take its place among the fine gem stones.

COUNCIL MEETING

At a meeting of the Council of the Association held at Saint Dunstan's House, Carey Lane, London, E.C.2, on Thursday, 6th June, 1968, the following were elected:—

Fellowship

Rae, Alexander Coventry, Markham, Canada Dip. 1963

Ordinary Membership

Achim, Donald L., Rochester, U.S.A.

Atapattu, Quenton Donovan, Mt. Lavinia, Ceylon

Bateman, Maureen Mary (Miss), London, N.4.

Bell, Ann Margaret (Miss), Glasgow, S.W.3.
Brown, William Peter, Hillingdon.
Burbanks, Christopher John, Staines
De Swarte, Georgina (Mrs.), Paris 9e, France
Dickenson, Hendrika Jacoba Margaretha (Mrs.), Greendale, Rhodesia
Dickson, David Wishart, Kilmarnock
Donaldson, James Roderick, Seabrook, U.S.A.
Fazli, Mohamed Saleem Mohamed, Colombo 5, Ceylon
Fukabayashi, Hirokichi, Hokkaido, Japan
Gosling, James Granville, Coulsdon
Gunde, Ladislaus Lewis, Limbe, Malawi
Hoberg, Gunter, Idar Oberstein, Germany
Johansen, Walter E., Morgan Hill, U.S.A.
Lang, Lorna Merle (Mrs.), Reservoir, Australia
MacDonald, Robert Dr., Kampala, Uganda
Phebey, Cyril Herbert, East Croydon
Seneviratne, Jinawaradasa Tissera Sandanayake, Ratnapura, Ceylon
Seward Jones, Mary (Mrs.), Crowborough
Telford, Henry, London, W.9
Van Twuyver, Henrik Gerhard, Oosthuizen, Holland
Watson, Lewis Charles, Morden
Westley, Marie Jean (Mrs.), Uxbridge

PROBATIONARY MEMBERSHIP

Cork, Malcolm Ellis, Chesham
Dunstone, Anthony, Fowey
Hooper, Cynthia (Miss), London, S.E.8
Karolus, Martin, Mannheim, Germany
Mooney, Robert Anthony, Birmingham, 6
Wakefield, Graham David, Horsham

FUTURE ARRANGEMENTS

The annual presentation of awards will be held at Goldsmiths' Hall, London, on 23rd October, 1968, at 7.15 p.m.

A reception will be held at Goldsmiths' Hall on 27th November, 1968, to celebrate sixty years of gemmology in Great Britain. Tickets will be required for this occasion and members will receive details during October. Overseas Members who may be in London at the time and who wish to attend should apply to the Secretary for a ticket, apart from official guests invitations will be limited to Fellows and Members.

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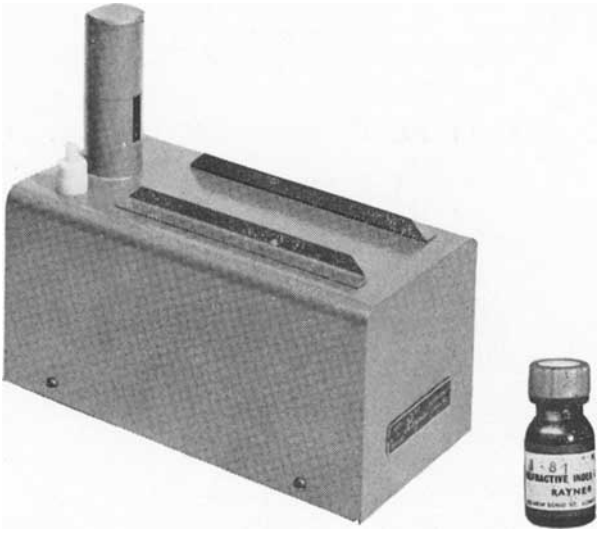

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GEMMOLOGICAL ASSOCIATION

of Great Britain

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