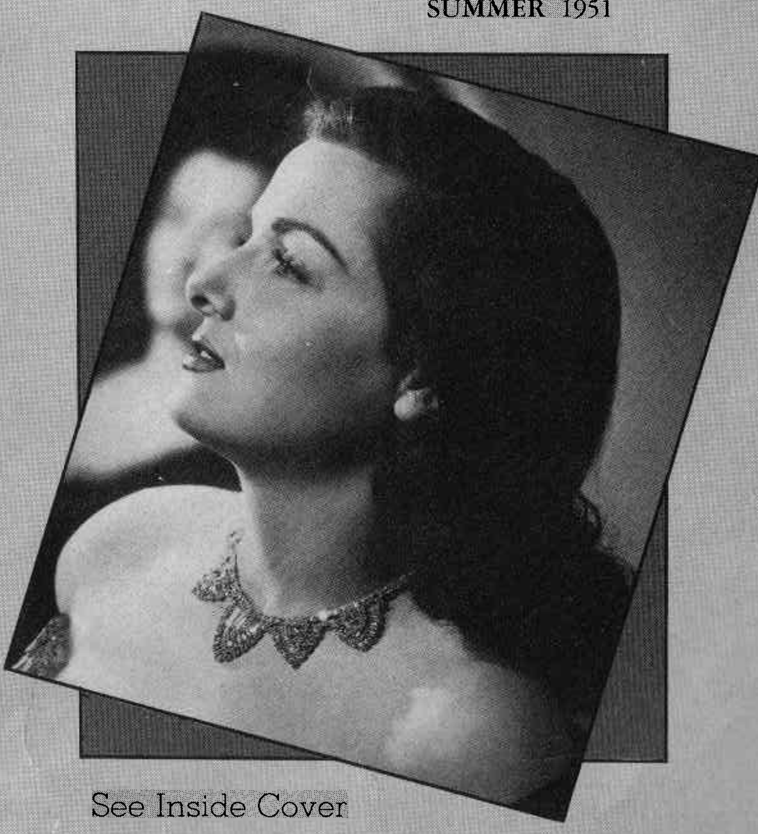
Gems and Gemology

SUMMER 1951



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GEMS & GEMOLOGY

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On the Cover

This diamond necklace plays an important part in the plot of "The Las Vegas Story," forthcoming RKO picture. Cartier designed, the necklace—featuring five large emerald - cut diamonds surrounded by baguettes and brilliants — is worn here, as in the film, by co-star Jane Russell.

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Celebrating Our 20th Anniversary

By

KAY SWINDLER

IN THIS YEAR of 1951, the founders of the Gemological Institute of America, and those pioneers who struggled courageously to establish a recognized educational program for jewelers, can look back over the twenty years of its existence with satisfaction and pride of accomplishment.

Few individuals are fortunate enough to live to see the fulfillment of a dream as revolutionary as the introduction of a professional goal based upon comprehensive educational requirements for experienced business men engaged in one of the oldest established trades in the world. Such, however, has been the privilege of Robert M. Shipley, who with a group of outstanding retail jewelers, was responsible for the founding of the Gemological Institute of America in 1931.

Robert M. Shipley, from whose idea the Institute was developed, had had sixteen years experience in the retail jewelry business, the last seven as owner of a large retail jewelry establishment in Kansas. During that time he had also served as President of the Kansas Retail Jewelers' Association and 2nd Vice President of the American National Retail Jewelers' Association. He was also instrumental in organizing into research groups a number of progressive minded jewelers in neighboring cities and states. These men were interested in the improvement and stability of the industry and believed its future success depended upon customer confidence which could be gained only through cooperation and greater knowledge. They were the forerunners of the present retail groups in the trade interested in the advancement of the industry through an exchange of ideas and progressive practices.

PREPARATION BEGUN

Since it was not possible to obtain the knowledge he wanted in this country, Shipley went to Europe where he remained for two years. There he visited museums, cutting centers, potteries, jewelry and silverware manufacturing plants, and art centers to investigate all possible sources of information on gemstones and other objects of art. At the same time he studied the only available sources on the subject and received the title of Gemological Diplomate from the Gemmological Association of Great Britain.

In Paris he was able to make his first contribution to adult education when he lectured on painting and other decorative

• Beatrice W. Shipley

arts at the Louvre and the Museum of Decorative Arts.

Planning to apply his newly gained knowledge of gemstones to the operation of a jewelry establishment of his own, he returned to the United States. Finding his country in the throes of the panic which followed the 1929 stock market crash, he decided to open art consulting offices in Los Angeles, while awaiting developments and a more propitious time.

G.I.A. FOUNDERS MEET

It was during this time that the late Armand Jessop, an officer of the California Jewelers' Association, invited Robert M. Shipley to organize and conduct an evening class in gemology at the University of Southern California, should sufficient interest be indicated by the jewelers themselves. Expecting only a few serious students to appear, Shipley was amazed when more than sixty jewelers enrolled for the courses. When the courses were repeated by demand he realized the possibilities of a carefully planned educational course for jewelers.

Accordingly, he invited those who had been interested enough to pass examinations to join him in the founding of the Gemological Institute of America as its first Sustaining Members. Most of those present realized what such a program could mean to them and their industry, and accepted. Today, the voting membership of the G.I.A., which is made up of its Sustaining Members, still includes many of these same men and their firms.

Almost immediately J. E. Peck, a gem collector of Campo, California, who had been driving more than 200 miles each week to attend the evening classes, made a substantial cash payment for a series of correspondence courses. At that moment the Gemological Institute of America became a reality.

The preparation of the first courses was then begun. Since operating income for the struggling new venture came solely from payments for the courses, Robert M. Shipley divided his time between preparing assignments and encouraging others to enroll. In those early years he personally traveled more than 25,000 miles annually to bring his message to jewelers in all parts of the country.

BEATRICE SHIPLEY CONTRIBUTES

As the work of the Institute progressed his wife, Beatrice Shipley, realized her inter-

• Robert M. Shipley

• Dorothy L. Phebus

• Isabelle Blanchard Hall

ests centered around her husband's altruistic ambition and from June 1932 until her retirement in June 1943, she was active in the management of the G.I.A. Her previous success in business and educational activities, as well as her experience in church and service work, contributed materially to the rapid growth of the Institute and its ultimate success. While Robert Shipley gave his time to the organization and development of the technical problems of the Institute, she gave hers to the management of finances and personnel.

Great credit is likewise due to the small but enthusiastic staff who worked so loyally with her in these early years. Those inspired

• View of early G.I.A. office. Mrs. Shipley in background dictates to Dorothy L. Phebus

few — Dorthy M. Jasper Smith who came as her secretary in 1932 and remains today as Executive Secretary of the G.I.A.; Dorothy Lovell Phebus who spent long, arduous hours from 1934 to 1947; and Isabelle Blanchard who remained a part of the staff from 1936 to 1949 — all gave generously of their time and ability and have left their imprint on the Gemological Institute of today.

FIRST STEPS TAKEN

The need for knowledge by jewelers twenty years ago was noticeably imperative. Shipley was well aware of the inadequacies in the trade and seriously undertook the preparation of the necessary courses.

The late T. Edgar Willson, editor of *Jewelers Circular-Keystone,* long a proponent of education for the jewelry trade, pledged his support as did the publisher P. M. Fahrendorf. So, too, did Francis R. Bentley and George Engelhard of *National Jeweler,* as well as others connected with the trade press.

The retail Jewelers' Research Group, an influential body of leading jewelers in the country, gave its approval to the proposed educational project and encouraged enrollment of most of its firms for the newly-offered courses. Nationally outstanding members of this group also became members of the first Board of Governors of the G.I.A.

More than any single individual engaged in a retail jewelry business, the late Godfrey Eacret of Shreve, Treat, and Eacret of San Francisco, was responsible for the permanent establishment of the G.I.A. With others, he investigated the plans and work of Robert M. Shipley. Always anxious to be affiliated with anything for the betterment of the trade, he gave of his rare ability, his time, and his counsel. In 1931 he became the first Chairman of the Board of Governors, retaining that post until his death in 1934.

Original research was carried on in a small laboratory. Here the first mail courses were prepared. Much of this material was voluntarily criticized by leading authorities in their specialized fields.

So many individuals and organizations were helpful in these early days of the G.I.A.'s history, that it would be impossible to include the names of all. However, special acknowledgment should be made to the late Warren Larter who expanded the contents of the jewelry assignments—

—to members of the Sterling Silversmiths Guild who furnished valuable contributions to the silverware assignments—

—to the Committee of One Hundred World Gem Authorities who, when the courses were in preparation, answered questionnaires on subjects upon which authors and gem experts had previously disagreed—

—to De Beers Consolidated Mines, Ltd., for the services of its Scientific Director, H. T. Dickinson, who with his assistants carefully examined the diamond assignments and made corrections or suggestions for their improvement—

—to jewelers in the smaller cities and towns throughout the country who studied diligently and whose belief in the Institute, and the principles for which it stood, gave importance and reality to the gemological movement, insuring its recognition as a living, vital force today.

For additional information incorporated in the courses, G.I.A. students and the industry also owe a debt to the authors of important text books in German, French, and English which Shipley used as a source of reference material.

WORK OF ANNA BECKLEY

Anyone who has known the Institute from the time of its early days to the present —has known Anna McC. Beckley by her accomplishments, if not in person.

She came to the Institute with Beatrice Shipley, her friend and associate at the Marlborough School for Girls, at the time of the G.I.A.'s founding. Her passion for accurate detail made her invaluable in her post as head of literary research. She it was who painstakingly verified and coordinated the facts which were incorporated in the courses. In this work she corresponded with authorities all over the world, checking and seeking to authenticate every bit of information.

She participated actively in the work of the G.I.A. until three years prior to her death in January 1950.

SON JOINS FOUNDER

Early in 1933 Robert Shipley, Jr., fresh from an aeronautical engineering course, came to the G.I.A. to work with his father. First a student, then an instructor, he ultimately became Educational Director of the Institute and an outstanding research man.

The younger Shipley assisted in the completion of the courses. Perhaps his greatest contribution to the advancement of the science of gemology has been his development of many gem testing and diamond grading instruments. Notable among these was his dark field illumination for the examination of gemstones—basic feature of the Diamondscope and Gemolite. Other instruments which were developed and perfected by him include the adaptation of polaroid to the gem polariscope, a universal motion immersion stage for gemstones, an inexpensive gem refractometer, among others.

Although not actively associated with the G.I.A. since, as a reserve officer, he was called to duty in 1941, he has continued since his retirement from the service in 1945 to improve and develop important gemological instruments.

• Anna McConnel Beckley

• Robert M. Shipley, Jr.

EDUCATORS AND SCIENTISTS COOPERATE

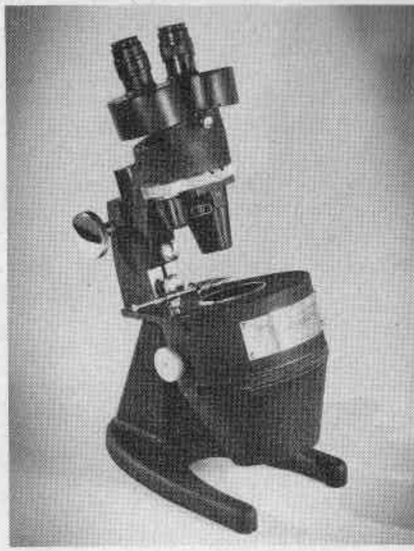
The affiliation of educators and scientists, who had previously regarded jewelers as tradesmen with little concern for accuracy in their representation of merchandise, was an important — though difficult — step forward.

The founder approached university professors who had conducted courses on gems,

• **Diamondscope — early model**

AMERICAN GEM SOCIETY FOUNDED

Instigated by Robert M. Shipley and under his guidance, graduates and students of the G.I.A. in 1934 organized and founded the American Gem Society as an instrument to further extend the ideals of the parent organization.



• **Latest model Diamondscope**

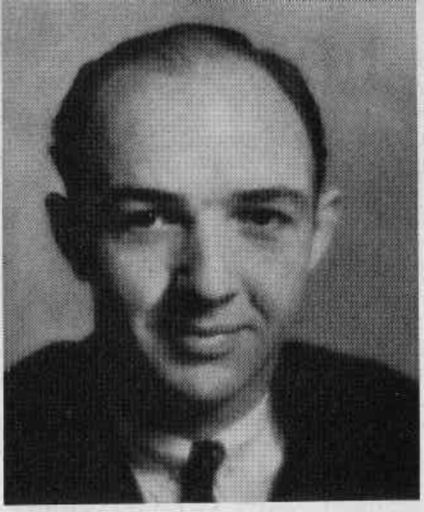
as well as museum curators whose departments included collections of gemstones, and persuaded many to accept positions on the Institute's educational boards.

Scientists, with the principal trade associations of the United States, selected members to serve on an Examination Standards Board, which prepared examinations for students of the Institute. Consolidation of the Educational Advisory Board and the Examination Standards Board took place in December 1948.

Today, the educational boards of the Institute are composed of gem educators, museum curators, and representatives of the jewelry industry, as well as scientists in the fields of gemology, geology, and mineralogy.

While the Gemological Institute is the educational force within the industry, the American Gem Society became the professional organization of the trade. The introduction of titles such as Registered Jeweler

Portion of Board of Governors in 1947. Left to right, Paul S. Hardy, Geo. Carter Jessop, C. I. Josephson, Oscar Homann, Burton Joseph, Leo J. Vogt, Myron Everts, Jerome B. Wiss



• **George Brock**

and Certified Gemologist added to the prestige of jewelers because the industry and public alike recognized the high standards of ethical practice and educational background necessary for the awarding of such honors.

At the time of organization, Robert M. Shipley was appointed Director of the American Gem Society, to serve concurrently with the G.I.A. He continued to serve in that capacity until February 1946, continuing in an advisory capacity after that date only to September 1947 when he withdrew entirely from A.G.S. affiliation. From 1934 until his retirement from active participation in the operation of the American Gem Society, the two organizations were closely associated, sharing both office

• **Edward F. Herschede, Sr.**

space and personnel although the governing bodies and officers maintained their separate entities.

G.I.A. BOARD OF GOVERNORS

Officers and the governing body of the G.I.A. have, from the first, served without monetary recompense. From 1932 a group of retail jewelers served as an advisory board under the name of the Board of Governors. This board recommended policies and maintained a close connection with the details of operation, meeting semi-annually and electing its own successors. The G.I.A. is still controlled by this same governing body which today consists of many G.I.A. graduates including representatives of both the wholesale and retail industry in the United States and Canada.

• **Leo J. Vogt**

Following the death of Godfrey Eacret, the first Board Chairman, George Brock of Los Angeles was chosen as his successor. He was subsequently succeeded by Edward Herschede of Cincinnati and Leo J. Vogt of Hess & Culbertson, St. Louis.

Presently serving as Chairman of the Board of Governors is H. Paul Juergens of Juergens & Andersen, Chicago. He was an early student of the G.I.A. and the third person to receive the title of Certified Gemologist. Having been in the retail jewelry business for more than half a century, he is a well-known authority and has always worked faithfully for any movement or cause which would bring benefit and advancement to the industry.

PARTNERSHIP DISSOLVED

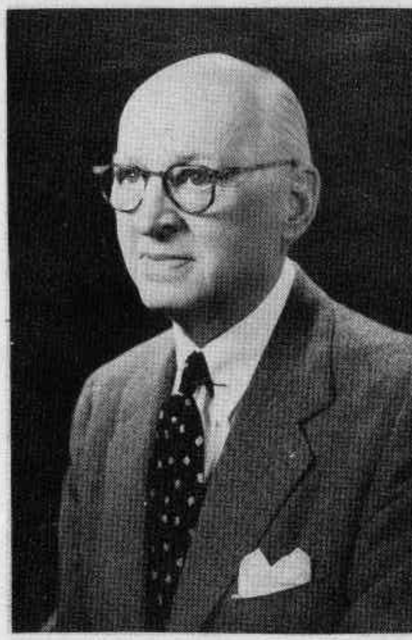
In 1942 the Gemological Institute of America, which until that time had been financed and legally operated by Robert and Beatrice Shipley as a partnership, was organized as a corporation. Throughout these years the business had been conducted on a non-profit basis, the Shipleys withdrawing only nominal salaries and a reasonable interest on their investment. At the time of incorporation they had been able to recover most of their original investment. Articles of incorporation provided that the G.I.A. continue to operate as a non-profit institution, supervised by a Board of Governors, and that income be spent only for salaries, research, and other operating expenses.

At last Robert M. Shipley's ambition to develop a successful educational organization for the benefit of the jewelry trade was accomplished. It had been his belief from the first that such an institution should be owned and controlled by the industry. Accordingly, July 1, 1943, the corporation, together with its valuable physical assets, copyrights, trade marks, and good will was transferred to the industry.

Acquirement papers provided that Shipley remain as Director of the Institute, but be permitted to retire or to engage in a more profitable activity when he had trained a successor. At the annual spring meeting of the Board in 1948 he announced his plan to retire in December, 1951.

SOURCES OF INCOME

As an educational institution, the Gemological Institute of America depends today upon income from its courses, small commissions on instruments, and nominal yearly dues from its Sustaining or Library Members.



• H. Paul Juergens

To insure the perpetuity of the Gemological Institute, an Endowment Fund was contributed by graduates and students as well as other interested representatives in the trade. In 1943 the nucleus of this fund had reached approximately $50,000 and was presented to the Institute. The fund has now increased to more than $100,000.

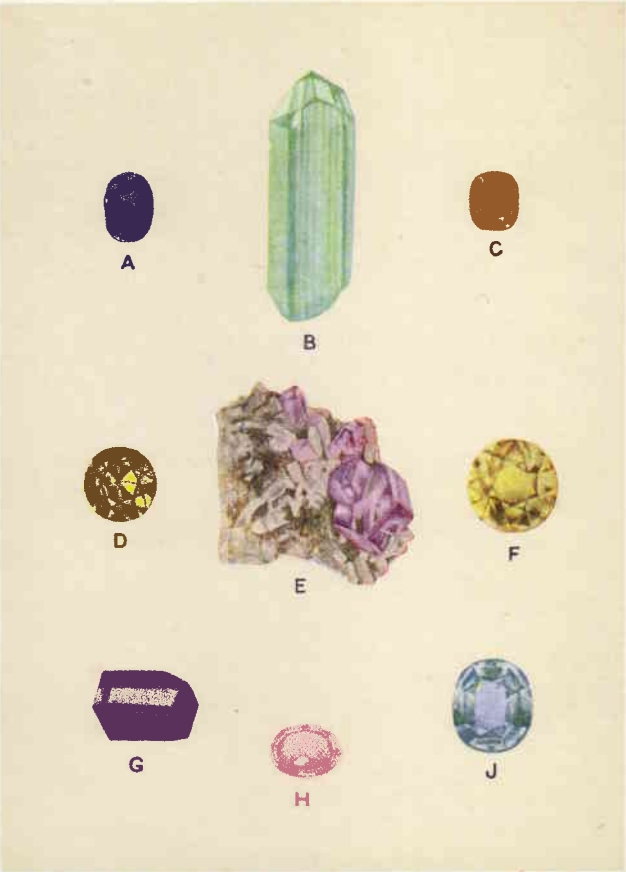
BOOKS PUBLISHED BY G.I.A.

Soon it became evident that books other than those available were needed and the Gemological Institute prepared and published such books. These include *Famous Diamonds of the World, Jewelers Pocket Reference Book,* and *Dictionary of Gems and Gemology* by Robert M. Shipley; *The Story of Diamonds* by Austin and Mercer, revised and supplemented by Shipley with an additional chapter by P. Grodzinski; *Handbook of Gem Identification* by Richard T. Liddicoat, Jr.; *Introductory Gemology* by Robert Webster, edited for American use by Virginia Hinton; as well as *A Ro-*

SAPPHIRE

Figure (A) shows several sapphire crystals embedded in the familiar gem bearing pegmatite typical of Russian deposits. The typical barrel-shaped hexagonal sapphire crystal at (B) is from Ceylon. The three fashioned stones at (C) are Montana sapphires, while the figure of Buddha (D) was carved from an Indian sapphire. The crystal (E) in matrix is typical of Montana stones. By comparing this plate with that of ruby one can easily note the difference between the characteristic crystal forms although both belong to the same system. Specimens from the British Museum (Natural History), London.

Printed in England.



EUCLASE, SCAPOLITE, ETC.

The blue gem (A) and the crystal (B) are both euclase. In appearance this stone can easily be confused with aquamarine, but because of its easy cleavage cut specimens are seldom seen. Brazil. Figure (C) shows a cut axinite from Dauphine. This mineral occurs in a wide range of pleasing colors and is very suitable for gem purposes. The yellowish stone at (D) is sphene, a rare gem famous to collectors for its high dispersion and refraction. The pink crystals at (E) are apatite, Mt. Apatite, Maine. Figures (F) and (H) show two scapolites from Madagascar and the Mogok ruby mines respectively. The crystal at (G) showing strong pleochroism is iolite and the cut stone (J) is apatite, also from the Burma ruby mines, Mogok. Specimens from the collection of British Museum (Natural History), London.

Printed in England.

man Book on Precious Stones by Dr. Sydney H. Ball which was edited by Kay Swindler and published posthumously.

Since 1943 the Institute has also published a scientific quarterly, *Gems and Gemology,* which with the appointment of an Editorial Board in 1947 became the official journal of the Gemological Institute of America.

RESIDENT CLASSES INTRODUCED

In 1937 the first Resident Class for G.I.A. correspondence course students was presented in Los Angeles. International recognition was attested about this time when Jose Beltri of Mexico City, Leopold Kahn of Manila, Edward J. Gubelin of Switzerland, and Sardha Ratnavira of Ceylon came to the Institute for periods of supervised study and remained to attend resident classes.

Although it was necessary to discontinue this service to students during the war years, in 1946 other resident classes were added to the curriculum. Today, the Institute conducts two resident classes of three weeks each, designed to provide for those students who desire it, grading and testing experience with diamonds and colored stones. Such classes are presented frequently in New York, Chicago, and Los Angeles with students attending from all parts of the North American continent, as well as countries abroad.

During the war years, G.I.A. Graduate Virginia Hinton, C.G., F.G.A., Houston, Texas, came to Los Angeles and assisted in the struggle to keep the G.I.A. functioning during this trying period of manpower shortage.

In 1946 Dr. George Switzer came to the G.I.A. as Director of Research. Considerable advancement was made before he left to accept a position as Associate Curator of Geology at the Smithsonian Institution. Dr. Ralph Holmes, Assistant Professor of Mineralogy at Columbia University spent the summers of 1946 and 1947 in Los Angeles where he conducted G.I.A. Resident Classes and helped in the revision of courses. He still continues on the staff as Consultant. Both Dr. Switzer and Dr. Holmes serve on the Institute's Educational Advisory Board.

FIRST PRESIDENT ELECTED

During the partnership period, and in the early days of the corporation's existence, Robert M. Shipley served as President of the Gemological Institute. Late in 1941 Dr. Edward Wigglesworth, outstanding among the scientists who had contributed to the progress of the G.I.A., became the first elected president of the industry-owned corporation and served in that capacity until his death in 1945.

Dr. Wigglesworth, for twenty years Director of the New England Museum of Natural History, guided the G.I.A. Boston Study Group from the time of its organization in 1935 until his death. For six years he served as Secretary of the Institute's Examinations Board, and was also Chairman for several years of the G.I.A. Educational Advisory Board.

When an eastern office was opened by the G.I.A. in Boston, in 1940, Dr. Wiggles-

• G.I.A. Resident Class, 1946. Left to right, H. Victor Paul, Heywood Macomber, Juell Bie, Montgomery Reed, J. Lovell Baker, Sardha Ratnavira, Arthur Muller, Leo Gardner, Guy Newcomb

worth joined the G.I.A. staff, without salary, as Director of its eastern laboratory there. His untimely death in 1945 precipitated the closing of the eastern branch of the Institute, which was reopened in New York City in August, 1948.

DR. KRAUS ACCEPTS PRESIDENCY

Succeeding Dr. Wigglesworth as President of the G.I.A. was Dr. Edward H. Kraus, Dean Emeritus of the Colleges of Art, Literature, and Science at the University of Michigan, who was recently elected G.I.A. President for the sixth consecutive year.

Long recognized internationally as an authority in the field of crystallography and precious stones, Dr. Kraus had conducted a course in gem identification from 1916 to 1933. In the early days of the Institute, more help and encouragement was given by him than by any other educator in the country. With H. T. Dickinson and the late Dr. Sydney H. Ball, Dr. Kraus was made an Honorary Member of the Institute

• Dr. Edward Wigglesworth. Below Resident Class in Los Angeles Laboratory, 1940. Left to right, Sam Tyack, Jerome B. Wiss, Martin Mager, John Vondey, Dr. Wigglesworth.

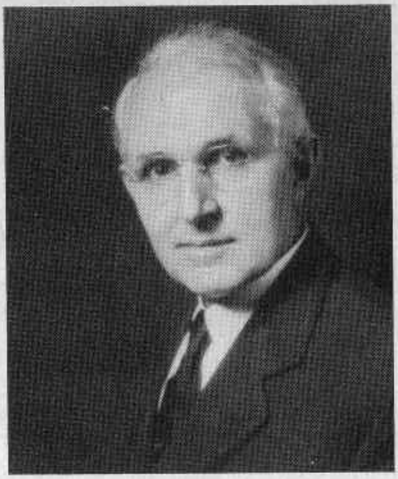
in 1943. He had also served as a member of the Examination Standards Board.

G.I.A. LABORATORIES

Benefits accruing to the industry through its acceptance of the need of a basic education for trade members had a very great influence on the trade. The growth and expansion of the G.I.A.'s research and testing laboratories was also of considerable importance. The provision of simple, exact means of identification for jewelers trained to use them, as well as reliable testing facilities for others, accelerated industry progress in the last decade.

The first G.I.A. Laboratory opened in Los Angeles in 1931 when Godfrey Eacret, first Board Chairman, donated a pearl endoscope and special pearl testing equipment. Shortly thereafter H. D. Feuer of New York City made a generous contribution for further laboratory equipment. Between 1940 and 1945, while the Boston Laboratory was in existence, rapid advancement was made. This continued with the opening of the New York Laboratory in 1948. Today, the G.I.A. operates two of the leading gemological laboratories in the world.

• **Early G.I.A. Laboratory**



• **Dr. Edward H. Kraus**

GEM TRADE LAB ACQUIRED

Since 1949 the Gem Trade Laboratory in New York City has been operated in conjunction with its own laboratory by the Gemological Institute. Trade members, who turned over the Gem Trade Laboratory to the G.I.A. in October of that year, are entirely distinct from any other Institute Members.

Since the Gem Trade Laboratory is operated by the Institute's eastern branch and handles more testing than any such laboratory in North America, the staff is constantly aware of any new imitations or frauds, and is in a position to develop and test new identification and grading equipment, as well as new testing procedures.

THOUSANDS STUDY COURSES

In the beginning ninety per cent of the G.I.A. students were jewelry store owners more than 45 years of age. Hundreds of them found the new knowledge of gemology of inestimable value in maintaining their leadership, and increasing sales of quality merchandise. These men, who were the early pioneers in the gemological movement, have contributed much to the high standards of the jewelry profession today.

• **Richard T. Liddicoat, Jr.**

They have made the industry and the buying public cognizant of the thoroughly educated and trained jeweler.

Every branch of the industry is represented by students and graduates of the G.I.A. with approximately 10,000 having enrolled for courses since its inception. Not only has it become national in scope in the twenty years of its existence, but international as well with correspondence students currently enrolled from seventeen foreign countries.

COURSES APPROVED BY V.A.

With the approval of the G.I.A. courses by the Veterans Administration in the fall of 1946, the opportunity for an educational background for younger men of the jewelry industry was made possible to great numbers. Since that date, 6600 veterans have enrolled with the G.I.A. for training under the GI Bill of Rights and many hundreds have completed their studies and acquired their diplomas in the Theory of Gemology, or the Theory and Practice of Gemology.

As a result of increased enrollments after the V.A. approval, it became necessary for the Gemological Institute to expand its own operating and teaching staff. To these individuals also must be given credit for the phenomenal success and rapid development of the Institute's activities in the past five years.

PRESENT INSTITUTE STAFF

All courses are prepared and conducted from the international headquarters of the Gemological Institute of America in Los Angeles. Approximately forty persons constitute the regular personnel of the G.I.A. at the present time.

Richard T. Liddicoat, Jr., to whom Robert M. Shipley delegated many of his duties in 1948, came to the Institute in 1940 upon recommendation of Dean Edward H. Kraus, as Assistant to Robert M. Shipley, Jr.

Prior to his connection with the Institute he was Assistant in Mineralogy at the University of Michigan. After almost four years absence while serving with the U. S. Navy, he returned to the G.I.A. early in 1946 as Director of Education.

Today, as the Institute's Assistant Director, he has assumed the general administrative duties of Director Shipley and since 1948 has been responsible for the development, advancement, and successful operation

• **Los Angeles Laboratory in 1947. Left to right, Robert Allen, Dr. George Switzer, Lester B. Benson, Richard T. Liddicoat, Jr.**

of educational and research departments.

He was instrumental in establishing the eastern headquarters branch and laboratory in New York City although he continued at the same time to give assistance to the Director in administrative and directive matters, and in the formulation of G.I.A. policy.

Dorothy M. Jasper Smith, who will retire from the G.I.A. late this year, has — with the exception of brief periods of absence — worked closely with Robert and Beatrice Shipley since she came to the Institute in 1932. She helped organize the original G.I.A. Study Groups in 1935 and has performed practically every task connected with the Institute.

In 1948, as Executive Secretary, she took over the expediting and coordination of certain definite projects formerly supervised by Director Shipley. She also serves as Secretary to the Board of Governors. Her withdrawal from active participation in the work of the Institute will be a distinct loss and no history of the G.I.A. would be complete without a sincere acknowledgment of her loyalty and her great contribution to the growth and success of the Institute during the almost twenty years of her tenancy.

Clare Verdera, who came to the Institute permanently in 1946 — after working for brief periods since 1942 — holds the position of Personnel Manager and Purchasing Agent. She also has charge of the Mimeograph Department where assignments and other forms are produced and, in addition, heads the Mailing and Shipping Department.

Lester B. Benson, directing resident class training, came to the Institute in the early part of 1947. Not only has he been responsible in the last few years for the organization, planning, and successful presentation of resident class work, but he has contributed much to recent research and revision of courses. He also acts as director of the Los Angeles Laboratory.

Public Relations Director for the Institute is Kay Swindler who came to the Institute in February, 1947 and heads the Publications Department. This department, in addition to preparing *Gem and Gemology* and the G.I.A. student publication, the *Loupe,* is also responsible for books published by the G.I.A., the preparation of pamphlets, brochures, educational supplies and various other printed matter — as well as for publicity and advertising used by the Gemological Institute.

• Dorothy M. Jasper Smith

In December 1947 G. Robert Crowningshield became a member of the Institute's staff, as Instructor. With the opening of the New York Branch in the fall of 1948 he was transferred there to assist in its establishment and management. Following the acquisition of the Gem Trade Laboratory in October 1949, he took over the operation of the combined laboratories in New York in February 1950 and is today Director of G.I.A. Eastern Headquarters and the Gem Trade Laboratory.

In March, 1948 Kenneth M. Moore joined the staff of the Institute as an Instructor. Today his responsibility covers supervision of the multitude of details connected with the mechanics of the Education Department's operation, including the steady flow of assignments to and from students, recording of grades, examinations, and other special services. He also heads the Instrument Department of the Institute.

Laurence L. Copeland came to the Institute in May 1948. In charge of course revisions, his work of keeping assignments up-to-date necessitates constant correspondence with authorities all over the world and the introduction into assignments of all late developments and changes. Thus, accurate and current information is available to students at the earliest possible moment. He also has charge of the coordination of the G.I.A. Study Groups which are currently active in twenty cities.

In January 1949 present Senior Instructor Joseph A. Phillips, Certified Watchmaker and experienced jeweler, was added to the staff as an Instructor. In addition to grading assignments, he has contributed much to the improvement of the G.I.A. study programs by preparation of photographic illustrations and tape recordings designed for study group and resident work of students.

Among other Instructors of the G.I.A., Bert Krashes, Gene Speitel, and Norman Smith have all had retail jewelry store experience, while James Small is a graduate geologist. John Ellison recently joined the staff at Eastern Headquarters.

Today, the Gemological Institute of America can look with pride upon its accomplishments. With graduates and students in all parts of the world, its story is now one of universal acceptance and recognition among scientists in all lands.

Many of the pioneers of the industry who were instrumental in its early organization and growth have continued to serve faithfully and enthusiastically throughout the years. Others, who have not lived to see the result of their courageous efforts, have been supplanted by a younger generation of jewelers. Into the hands of these many young men and women, who have gained inspiration and knowledge from the courses of the Gemological Institute, will fall the task of carrying on the work which was begun by Robert M. Shipley and carried on so ably by him and his associates for twenty years.

• Early G.I.A. Graduates. Left to right, standing, Willam Glick, Edw. Herschede, Sr., Edward Herschede, Jr., Nolte Ament, Guy Schwartzlander, Carleton Broer, H. I. Rosencrans, C. I. Josephson, Hans B agge. Seated, Chas. Carolyne, Paul Cohard, H. Paul Juergens, Del Hohenstine, Wm. Johnson

• Itambe Mountain, 48 kilometers east of Diamantina

The Diamond Mines of Diamantina—past and present

By

THOMAS DRAPER

Part I

THE City of Diamantina takes its name from its diamond mining industry which began more than two hundred and twenty years ago and has been carried on without a break during this entire period. Originally it was known as *Tejuca* or the "Muddy Place" and its present, more appropriate name was not conferred upon it until 1838 when it was declared a municipality with Diamantina as its capitol.

There has never been a time in its history when someone was not somewhere searching for the coy diamond. Its rivers and minor streams have been dammed and their bottoms stripped down to bedrock. Its hillsides and flats are scarred and huge excavations have sent millions of tons down to the sea. There is hardly any part of its surface, unless covered by its dull gray quartzites, in which diamonds do not occur and that cannot profitably be worked provided there is water within a reasonable distance.

New finds are constantly being made or old workings rediscovered. An amusing incident took place only a few days ago when bulldozers, enlarging the airfield, uncovered *gorgulho* (diamond bearing gravel) and special precautions had to be taken to prevent its clandestine removal from the depressions that were being leveled. There is probably no other airfield in the world that can be said to be paved (sparsely) with diamond.

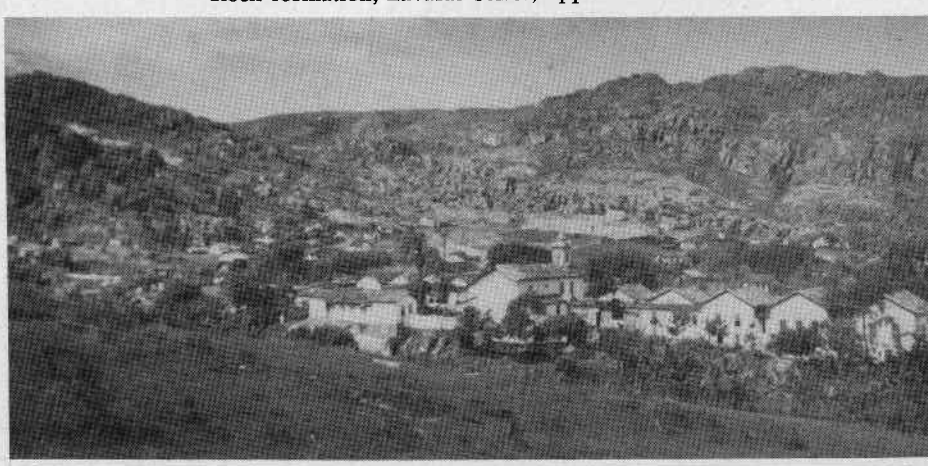
However this is merely a diversion from the main theme which is to present a picture of the past and an estimate of the future possibilities of this historical region which, in its early days, played a prominent part in shaping the destiny of Portugal. Wealth derived from its diamonds not only helped to place that country at the zenith of its glory but also contributed, at a later stage, to its release from the French occupation by paying part of the indemnity exacted by France during the Napoleonic wars.

Historical research now tends to discredit the original versions that diamonds were found, but not recognized as such, in the *bateas* of the gold miners who had reached the region in the closing years of the 17th century. The legend that diamonds were first identified by a priest, who had been to the diamond fields of India, is now also discounted. This does not detract, however, from the fact that the discovery forms one of the most fascinating chapters in the historical annals of Brazil. Indirectly, Diamantina owes its origin to the prolonged search for emeralds which eventually led to the discovery of the Ouro Preto gold field and subsequently extended into the Diamantina region itself.

In his *Memorias do Districı Diamantino* of which, unfortunately, no English translation exists, Joaquim Felicio dos Santos, a native son of Diamantina, relates the circumstances under which the pioneer *bandeirantes* arrived. Written nearly 100 years ago by one of the third generation of pioneers, when he had access to official documents now scattered far and wide, it forms one of the most interesting and reliable records of the initial stages of diamond mining in Brazil. In it he describes the harsh conditions under which mining was permitted—subject to restrictions and to penalties out of all proportion to the offenses committed.

Under the Portuguese regime, access to the diamondiferous region was strictly forbidden even to the Portuguese themselves unless they could provide an adequate reason. This ban was due to an effort to suppress clandestine mining and contraband exportation of diamonds which constituted an ideal medium for smuggling. There is said to have been considerable leakage through this practice, but probably not on the scale generally accepted by historians. The arid, rugged, and inhospitable nature of the region, devoid of all commodities except those imported from other sources; the fact that all natural exits were patrolled and that hostile Indians still existed; coupled with

• Rock formation, Lavaras Series, opposite Diamantina



the severity with which infractions were punished, must have rendered contraband mining a very hazardous venture.

During the Portuguese administration, Diamantina suffered varying degrees of fortune or misfortune according to the disposition of the succession of *Intendentes* (administrators) appointed to enforce the laws promulgated in Portugal. Some of its representatives were tolerant and winked at any infractions. Others were harsh and exacted the utmost obedience to the restrictions and vexations imposed by Portugal.

Except for its official records and the frequent and eloquent protests of its citizens, Diamantina remained a 'closed book' until 1809 when John Mawe, an English mineralogist, was allowed — in fact commissioned — by Prince John, the Regent of Portugal, to visit the region. For this purpose he was given an official escort and authority to consult public archives.

Mawe was followed shortly afterwards by Saint-Hilaire, a French botanist; by Spix and Martius, two Austrian scientists; by Baron W. L. von Eschwege; by Sir Richard Burton, and others whose books threw further light on the dark period preceding their visits.

Mawe's book *Travels in the Interior of Brazil* was published in 1812. It has since been reprinted and also translated into French, Italian, Dutch, Swedish, German, Russian, and Portuguese. He does not express any opinion regarding the origin of the diamonds although he does seem to have made some inquiries and to have been informed that it was not unusual to find both gold and diamond in a conglomerate. No trace of the matrix itself had been found. The conglomerate, locally known as *canga,* of which they gave him a sample containing both gold and a diamond, is not an uncommon occurrence and merely consists of an agglomeration of pebbles and sand with a ferruginous (iron rich) binding usually found on bedrock.

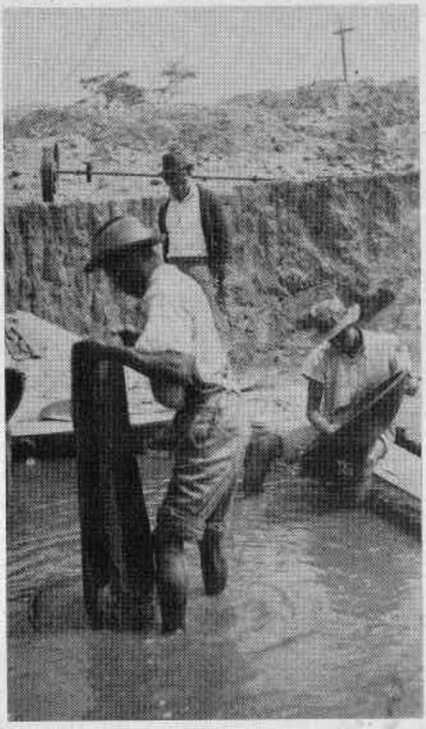
As the first book of its kind to deal with diamond mining in Brazil, *Travel in the Interior of Brazil* describes not only Mawe's journey, which began in the Argentine and ended in Bahia, but also includes sketches of the diamond mining methods used at the time of his visit. One of these, frequently copied by later writers, shows a row of slaves, neatly dressed in white smocks, washing for diamonds below a grass roof under the supervision of *feitores* (overseers), each

• Discarded massa at the Duro Mine


Map of Diamantina Fields
Jequitinhonha River
Dona Maria (Ilha)
Maria Nunes
Rio Caethe-Mirim
Jombo
Jobo
Corrego Novo
Quartais
Rio Pardo Grande
Campo Sampaio
Duro and Barro Minos
Poção
São João da Chapada
Chapada (Sold)
Corrego S. João
Morrinhos
Calde
Pecado
Damasio
Bamba
Caldeirões
Perpetua
Brumadinho
DIAMANTINA
Rio Grande
Guinda
To Rio das Velhas
Rio Pardo Pequeno
To Corinto and Barão
Bello Horizonte
Bandeirinha
Canudinhos
RIBEIRÃO DO INFERNO
Road to Diamantina
Dattas Mines
Souvea
Rio de Dattas
Corrego S. João
RIO PINHEIRO
Biribiri
Rio Manso
Mendanha
Carranda
Larra do Matto
Mosquito
Potão do Moreira
Pedro Dias
Bom Successo
Boa Vista
Villa Rica
Currallinho
(Extracão)
Serrinha
Itaipara
JEQUITINHONHA RIVER
Jequitinhonha do Campo
JEQUITINHO
Corrego de Mel
C. Mae de Agua
Angu Duro
SCALE 1: 800,000
Aug 2nd 1951

with a whip in hand, seated on high armless and backless stools to prevent them from falling asleep.

The washing plant consisted of a series of shallow divisions, slightly inclined toward the discharge end, approximately three yards long and three feet wide. The upper end of each division formed part of a covered flume at right angles to the divisions, from which water was received through an aperture six inches wide and one inch high. A slave in each division scraped in the gravel, previously deposited on and behind the main flume, as required and stirred it against the current until the water ran clear. After this the *batida* (concentrated product) was removed to be washed in a *batea.* Except a few 'old timers,' *garimpeiros* have now substituted the South African sieves for the *batea* which was both cumbersome and unsafe for diamonds. Many of the old talus heaps of the *bandeirantes* were subsequently successfully rewashed with sieves. As a matter of practical experience it was found that usually the larger stones escaped detection due, no doubt, to the fact that the oversized material was carelessly scraped out from the *batea.*



• **Panning concentrate in the Batea**

Mawe's journey from Rio took a month and as he passed through Ouro Preto he showed the gold miners how to recover mercury from their gold refining operations. He also included a visit to the topaz mines in Brazil, the best of which are still producing. On his passage through Itabira do Matto Dentro he left drawings of furnaces for smelting iron ore.

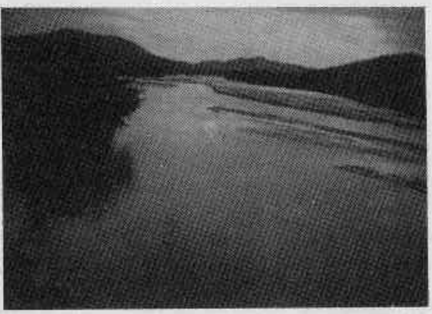
In Diamantina, Mawe became the guest of the *Intendente* (administrator) of the district, Manoel Fereira da Camara, who invited him to visit the diamond washings at Mendanha on the Jequitinhonha river (pronounced Jeki-tin-no-ni-yo).

Camara was one of the most famous of the *Intendentes* and was also the first native born Brazilian to be honored with this post during the Extraccao period when diamond mining was being done by and for the government. A man of progressive ideas who had studied mining and mineralogy in Europe and was familiar with mechanical appliances, he tried to increase production by installing elevator buckets attached to rawhide rope driven by an overshot waterwheel. Mawe made a sketch of this and it is shown in the first edition of his book. Camara also installed "a system of cylinders" for elevating the *cascalho* out of the pit. It is interesting to note that these innovations were resented by the slave owners. These men feared their revenues would be affected as the government might reduce the number of slaves hired from them for which it paid at the rate of approximately 356 millegrams of gold per slave, per day.

Mawe spent five days in Mendanha where he found about 1000 slaves at work in a section of the river which had been diverted into a ditch by damming it "with thousands of sandbags." This also seems to be an innovation introduced by Camara since there is no previous record of constructing a dam in this way.

At the time of Mawe's visit Mendanha consisted of about 100 round, wattle-and-daub huts thatched with grass resembling the "rondavels" of Africa.

Speaking of the Jequitinhonha itself, Camara informed Mawe that almost any section could be relied upon "to yield 10,000 carats when its turn came, or if at any time there was need of an urgent supply."



• **Jequitinhonha at Cambraia**

Mawe noted that the slaves were well treated and, although compelled to work from daylight to dark, were given periods of rest during the course of the day, especially those whose stooping positions rendered their work irksome.

Another interesting observation was the absence of any large diamonds in the parcels he saw. He mentions one of 16½ carats,—one carat less than would have awarded the slave finder his freedom. In the parcels sent to Portugal during Camara's administration, only two weighed slightly more than 30 carats. During part of the Extraccao Period, lasting 47 years from its inception, only 115 stones exceeded 17½ carats. There is no authentic record of a diamond exceeding 60 carats in weight from the Diamantina field. During the past thirty years only four have exceeded 50 carats, one of which was found by chance in the tailings of the Boa Vista mine.

In his semiofficial position Mawe was allowed access to the official records of production and estimated that at the time of his visit it reached 25,000 carats. Between 1801 and 1806, both inclusive, 115,675 carats and 17,300 pounds sterling worth of gold were sent to Portugal, produced at a cost of 204,000 pounds sterling.

During his stay in Diamantina, Mawe was impressed by the social graces and luxury of its inhabitants who imported bacon, cheese, butter, beer, and other commodities from England, and who dined off the best Wedgewood and Sevres crockery. While there he taught his host how to make beer and his hostess how to make butter and cheese. The beer, he confesses, was not very successful but he prides himself on the quality of the cheese.

• **Massa at Serrinha Mine**

Before leaving Diamantina, Mawe was taken on a side trip to the Rio Pardo on the opposite side of the watershed where the Extraccaco had another of its gangs at work. Here he noted the difference in the appearance of the diamonds. He mentions the green coated stones characteristic of the Corrego Novo, Campo Sampaio, and Sao Joao da Chapada mines, discovered at a later date. from which they were probably derived. This green coating does not yield to any acids nor does it affect the quality of the stone, but it does render it difficult to spot any internal defect.

An interesting phenomenon, as regards diamonds, was first noticed at Corrego Novo by the writer's brother, Edward. This, the intergrowth of diamonds and quartz, was subsequently repeated a number of times at the Boa Vista mine. The Corrego Novo specimen was forwarded to the States where it was described by Professor J. B. Colony in the *American Journal of Science,* Ser. V; Vol. 5.

It appears, however, that this peculiar and interesting fact was first described in 1858 by P. Hartig in *Description d'un diamante remarquable contenant des cristaux"* in *Verhandlingen der Koniglyke Academie van Wetens Chappen.*

While in Brazil, Mawe made a collection of its semiprecious stones which he described in his *Treatise on Diamonds and Precious Stones including their History,* and in which he shows a colored example of a Brazilian Imperial topaz. "There is no doubt," says an introduction to the Portuguese version by Clado Ribeiro Lessa, "but that the publication of this treatise was the principal factor in popularising the Brazilian gems among the English, especially the Imperial topaz, . . . and to no lesser extent crysoberyl and a variety of blue topaz known as 'Brazilian sapphire' which up to that date

• Close up of massa at Serrinha Mine showing pebbles and diamond-heavy matrix. Note orientation of pebbles

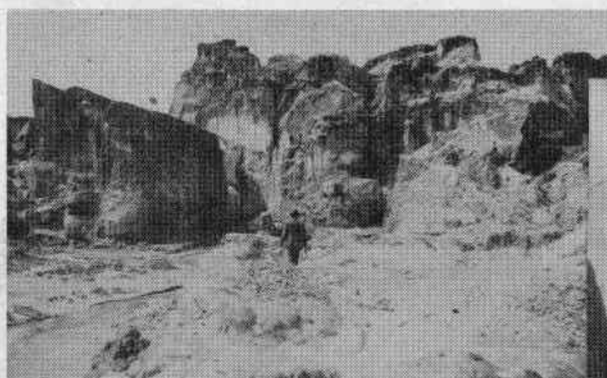
had been regarded as a mere scientific curiosity confined to mineral cabinets."

Camara's term as *Intendente* ended in 1822 when he left Diamantina to assume his position as one of the Brazilian legislators elected after the newly won freedom from the Portuguese regime. He was, as his life *O Intendente Camara* by Marcos Carneiro de Mendonca shows, one of the most enlightened and progressive Brazilians of his time. He was the first to appreciate the importance of the Brazilian iron ores and was responsible for erecting the first smelter of its kind at Morro do Pilar, which Baron von Eschwege was engaged to operate.

Camara's departure coincides with the decline in production of the Extraccao period to a point when it began to incur losses. The number of slaves employed had, by successive stages, been reduced from 5000 to less than 1500; and the armed patrols to such an extent that they were no longer able to control clandestine, if not open, diamond mining.

This state of affairs led to the discovery in 1824, by a *garimpeiro,* of one of the most remarkable occurrences in the region—the Pagao mine from the surface of which 25,000 carats were obtained by Camara's successor. This was the result of surface enrichment of a purely alluvial character in which, apart from a little earth, only two minerals, quartz and diamonds, occurred. The character of the quartz indicated that it had been decomposed *in situ.* The importance of this fact was not appreciated until later, when a *garimpeiro,* Antonio Evarista by name, in 1919, followed the quartz vein down and, in four years, took out more than 5000 carats of even-sized, white, frosted stones such as have not been found elsewhere in this region. This is especially interesting because the district lies between the Campo Sampaio and Sao Joao da Chapada Mines both of which produce the green coated diamonds previously mentioned. The fissure eventually pinched out and is no longer being exploited, but it adds to the many perplexing problems regarding the origin of the diamond in Brazil.

A few years later this problem was complicated by the discovery of the 'High Level' mines which, it is presumed, are responsible for shedding the alluvial diamonds found throughout the region. Up to this point, by



• Massa at Guinda Mine. At right, weathering of rock in Diamantina

both the Contract and Extraccao Periods, operations had been confined to alluvial mining in the river beds during the dry season and to the *grupiaras* and higher levels during the wet season. With large numbers of slaves, hired from local residents, to support, diamonds were traced during the wet season to the apex of the watershed and eventually found to extend down the opposite side. Although the areas that could be worked were defined by the government, they were successively extended until finally the entire area of the field, comprising many hundreds of square miles, was proved to be diamondiferous.

Diamond mining had in the meantime passed through successive stages comprising:

1. The Discovery Period, 1728 to 1740, during which various forms of taxation were tried without success.

2. The Contract Period, 1742 to 1771, when the exclusive right to mine for diamonds was sold to the highest bidder. This was subject to certain restrictions including limitations of the number of slaves employed, and the obligation to carry on mining in the Jequitinhonha river or its tributaries by unbroken successive stages upstream, in order to prevent pollution of intermediate areas.

3. The Extraccao Period, 1772 to 1842, when mining was done for and by the Crown of Portugal.

4. The Post-Extraccao Period included the discovery and development of the 'High Level' mines, some of which are presumed to constitute the matrix of the diamond in this region if not elsewhere in Brazil.

To Be Continued

• Canal cut through decomposed basic igneous rock, separating massa outcrop at Daltas Mine

• General view of old workings of Serrinha Diamond Mines near Diamantina

Nomenclature of Gems

ADOPTED BY THE AMERICAN GEM SOCIETY

By
E. H. KRAUS
President, Gemological Institute of America

At the conclave of the American Gem Society held in Boston in 1949 and in Detroit in 1950, it was reported that a standardized nomenclature of gems was being prepared.[1] After much study, correspondence, and discussion the appended nomenclature list was adopted by the American Gem Society on March 18, 1951, at the conclave held in Washington, D. C. In this list, gems are classified in four groups, as follows: A, Important Gemstones; B, Organic Gem Materials; C, Other Gem Minerals; and D, Synthetic Gem Materials.

The standardized nomenclature marks a distinct advance for gemology in the United States and Canada. In the case of a few terms there may be difference of opinion as to the wisdom of the actions taken. It is understood, however, that the list should be given careful consideration by the members of the Society, and that in three or five years some revision may be deemed advisable. During this period the new B.I.B.O.A. list can also be studied.[2] It is hoped that the differences, which exist between these and other lists, can then be reconciled and a truly international nomenclature established.

1. See *Gems and Gemology,* Vol. VI, pages 147-50, and 278-290.
2. The B.I.B.O.A. list will be published in this journal when it has been received from European authorities.

SPECIES	DESCRIPTION	CORRECT NAMES
	A. IMPORTANT GEMSTONES	
DIAMOND	Transparent. Colorless. All colors, usually in very light tones. Also black	Diamond
CORUNDUM	Transparent red (not including pink or other light tones of red)	Ruby
	Transparent blue	Sapphire
	Transparent. All colors other than red	Pink sapphire, Yellow sapphire, Purple sapphire, Green sapphire, etc.

SPECIES	DESCRIPTION	CORRECT NAMES
	Transparent colorless to pale bluish white	White or colorless sapphire
	Asteria–6 pointed star in semitransparent to semitranslucent gray and all above colors except red, also gray, black, or brown	Star sapphire
	Red asteria – same	Star ruby
	Pink or pinkish gray – same	Star sapphire
CHRYSOBERYL	Transparent greenish yellow, green, yellowish green, greenish brown to brown	Chrysoberyl
	Transparent to translucent. Any of above colors exhibiting chatoyancy (a distinct movable band of light)	Chrysoberyl cat's-eye
	Transparent green in daylight, red to purple in most artificial light	Alexandrite
	Transparent to translucent as above, but chatoyant	Alexandrite cat's-eye
SPINEL	Transparent red, pink, blue, yellow to orange-red, green, purple, violet, red-brown; also opaque very dark green to black	Spinel, red spinel, etc.
TOPAZ	Transparent yellow, light blue, very light red to red, orange, colorless, brown, green	Topaz, Yellow topaz, Blue topaz, Pink topaz, etc.
BERYL	Transparent intense green to bluish green	Emerald
	Transparent light green	Beryl
	Transparent yellow	Golden beryl
	Transparent light blue to greenish blue	Aquamarine
	Transparent light red (rose or pink), light purple (rose)	Morganite
	Transparent. Other colors	Beryl
ZIRCON	Transparent colorless, yellow, blue, green, orange to orange-brown, violet, etc.	Zircon Blue zircon, Green zircon, etc.

SPECIES	DESCRIPTION	CORRECT NAMES
TOURMALINE	Transparent. All colors and colorless	Tourmaline Green tourmaline, Colorless tourmaline Red tourmaline, etc.
	Transparent to translucent with chatoyant band of light	Tourmaline cat's-eye
GARNET GROUP	All colors in which the mineral occurs	Garnet
ALMANDITE	Transparent red to purple	Almandine garnet or almandite
PYROPE	Transparent red to reddish brown	Pyrope garnet or pyrope
RHODOLITE	Transparent light to medium red-purple to violet	Rhodolite garnet or rhodolite
GROSSULARITE	Transparent yellow to orange-brown	Hessonite garnet or hessonite
	Transparent yellow-brown to reddish brown	Hessonite or cinnamon stone
	Translucent to semitranslucent yellowish green	Grossularite or green garnet
ANDRADITE	Transparent green	Demantoid Garnet or demantoid
PERIDOT (Olivine)	Transparent light to dark yellowish green, brown, light yellow-green to yellow	Peridot
QUARTZ	Transparent violet to purple	Amethyst
Crystalline	Transparent to translucent light red (pink) or light purplish red (rose)	Rose quartz
	Asteriated (exhibiting 6 pointed star) in pale tones of same color	Star rose quartz or star quartz

SPECIES	DESCRIPTION	CORRECT NAMES
	Transparent yellow, orange, yellow-brown, red-brown	Citrine or topaz quartz
	Transparent grayish brown to almost black	Cairngorm or smoky quartz
	Translucent grayish green, light gray, greenish yellow, brownish, brownish red, or bluish with moving band of light	Quartz cat's-eye
	Translucent yellowish to brown with silky sheen as stone is moved. Also dyed brownish red and gray	Tiger's-eye
	Translucent bluish with silky gray sheen	Hawk's-eye
	Translucent grayish, yellowish, brownish, or brownish red glittering with red spangles. Green with silver spangles	Aventurine or aventurine quartz
Cryptocrystalline or Chalcedony Quartz	Semitransparent to translucent white to bluish Sometimes dyed blue, green, yellow, brown, etc. Dyed Chalcedony long known in trade as "onyx" with color prefix	Chalcedony, white chalcedony, etc.
	Opaque black (usually dyed)	Black chalcedony
	Translucent red to brownish red, orange to orange-brown	Carnelian
	Translucent red-brown or yellowish brown to brown	Sard
	Translucent to opaque. Flat parallel layers of gray or black or any color but red, orange or brown alternating with white. (Often used in trade to denote dyed color)	Onyx
	Translucent to opaque. Flat parallel layers of carnelian or sard alterating with white or black chalcedony	Sardonyx
	Semitranslucent dark green with red spots	Bloodstone or heliotrope
	Semitransparent to translucent light yellowish green (apple green)	Chrysoprase
	Translucent. Curved bands alternating in various colors	Agate or a banded agate

SPECIES	DESCRIPTION	CORRECT NAMES
	Translucent white with green, black, brown, or reddish moss-like inclusions	Moss agate
	Opaque, red, yellow-brown; sometimes green or white	Jasper
SPODUMENE	Transparent light yellow to greenish yellow, bright yellowish green to bright green	Spodumene
	Transparent rose-pink or violet	Kunzite
JADE GROUP JADEITE	Semitransparent to opaque, green, white, white with green inclusions, also brown, orange, reddish pink, violet, bluish, dark green to almost black	Jadeite
NEPHRITE	Semitransparent to opaque green, also gray, brown, reddish, bluish, light bluish violet, yellow, black or white	Nephrite
OPAL	Transparent to semitransparent, white to colorless with play of color	Opal, white opal
	Transparent to translucent, black or very dark gray, blue or green with play of color	Black opal
	Transparent orange-yellow to red (May show play of color)	Fire opal
FELDSPAR GROUP	Transparent colorless to light yellow	Orthoclase
ORTHOCLASE	Colorless to milky with billowy bluish light	Moonstone or adularia
MICROLINE	Semitranslucent bluish green to yellowish green	Amazonite, amazon stone
ALBITE	White to nearly colorless with moving light	Moonstone
OLIGOCLASE	White to nearly colorless with moving light	Moonstone
LABRADORITE	Semitranslucent grayish with overall flashes of bluish, greenish, yellowish, reddish orange or bronze. Also transparent yellow	Labradorite
	Transparent yellow or opaque black	Andradite garnet or andradite

SPECIES	DESCRIPTION	CORRECT NAMES
LAPIS LAZULI (A combination of minerals)	Opaque, intense greenish blue to violet-blue usually with brassy specks of pyrite	Lapis Lazuli
	Light blue with veins of white matrix and often tinged or spotted with green	Lapis Lazuli
	Light blue to blue with large proportion of matrix	Lapis matrix
TURQUOIS	Opaque light blue to light blue-green, sometimes with tracery of veins of brown limonite	Turquois or turquoise
	Same colors with larger amounts of limonite or other matrix	Turquois matrix
	B. ORGANIC GEM MATERIALS	
PEARL	Semitranslucent white, creamy, pinkish, and light yellow, green, blue, violet, gray, etc.	Pearl
	Semitranslucent mother of pearl ball covered with layers of pearl nacre of above colors	Cultured pearl
	Semitranslucent purplish red, blue—almost black; also light grayish yellow	Clam pearl
	Semitranslucent dark metallic, blue, green, brown, etc.	Black pearl
	Semitranslucent pink or white without nacre	Conch pearl
AMBER	Transparent to opaque pale yellow to reddish brown to dark brown. Also tinged with green or blue. Also whitish or cloudy	Amber
	Translucent pale yellow to dark brown, reconstructed by softening small pieces and bonding by pressure	Pressed amber
CORAL	Semitranslucent to opaque white to dark red, cream, brown, blue and black	Coral
JET	Opaque black	Jet

SPECIES	DESCRIPTION	CORRECT NAMES
	C. OTHER GEM MATERIALS	
ANDALUSITE	Transparent, yellow-green, brown-green, red-brown. Also gray, nontransparent	Andalusite
APATITE	Transparent, green, blue, violet, purple, pink, yellow or colorless	Apatite
AZURITE	Translucent to opaque blue	Azurite
BENITOITE	Transparent, blue to colorless	Benitoite
CHLORASTROLITE	Semitranslucent, dark green with white markings. Chatoyant	Chlorastrolite
DIOPSIDE	Transparent, light to dark yellowish green to nearly black	Diopside
ENSTATITE	Transparent, yellowish green	Enstatite
EUCLASE	Transparent colorless, light blue, light green	Euclase
FIBROLITE (Sillimanite)	Transparent, colorless, grayish blue, dull green Translucent to opaque, colorless, grayish blue, dull green	Fibrolite or sillimanite
FLUORITE	Transparent, all colors	Fluorite
HEMATITE	Metallic, dark gray to black	Hematite
IDOCRASE (Vesuvianite)	Translucent to transparent, yellowish green to greenish brown	Idocrase
IOLITE (Cordierite, Dichroite)	Transparent grayish blue, blue, blue-violet	Iolite
KYANITE	Transparent light to dark blue. Also colorless gray, green and brown	Kyanite
MALACHITE	Opaque, banded dark and lighter green	Malachite
MARCASITE	See Pyrite	
MOLDAVITE (Natural glass)	Transparent, yellowish green to slightly brownish green	Moldavite

SPECIES	DESCRIPTION	CORRECT NAMES
OBSIDIAN (Volcanic glass)	Transparent to opaque, gray to black, brown, red-brown, green, etc.	Obsidian
PREHNITE	Translucent, light yellow-green to greenish yellow	Prehnite
PYRITE	Opaque, metallic, pale brassy yellow, incorrectly called marcasite in trade	Pyrite
RHODONITE	Semitranslucent, light red	Rhodonite
SCAPOLITE	Transparent to translucent, light red, yellow, blue, violet, may be chatoyant	Scapolite
SERPENTINE	Translucent to semitranslucent. Green to yellow-green mottled	Serpentine
SILLIMANITE	See Fibrolite	
SMITHSONITE	Translucent, yellow, blue, green, brown	Smithsonite
SPHENE	Transparent, yellow to green, brown, reddish brown to light purplish red	Sphene
STAUROLITE	Opaque to translucent, black to brown	Staurolite
STEATITE (Soapstone or Talc)	Opaque, gray, brown, grayish green	Steatite, soapstone, talc
THOMSONITE	Translucent to opaque, white to red-brown, green. Mottled, often with "eye" markings	Thomsonite
VARISCITE	Semitranslucent, yellow-green	Variscite
ZOISITE	Translucent to opaque, purplish red, greenish gray to pale yellowish green	Zoisite

SPECIES	DESCRIPTION	CORRECT NAMES
	D. SYNTHETIC GEM MATERIALS	
SYNTHETIC CORUNDUM	Red (Medium orangy red to purplish red)	Synthetic ruby
	Pink	Synthetic pink sapphire
	Blue	Synthetic sapphire
	Orange	Synthetic orange sapphire or synthetic padparadsha
	Yellow	Synthetic golden sapphire
	Green	Synthetic green sapphire
	Violet	Synthetic amethystine sapphire
	Alexandrite-like	Synthetic alexandrite-like sapphire
	Colorless	Synthetic white sapphire
	NOTE: Names such as "synthetic zircon," "synthetic tourmaline," "synthetic kunzite," "synthetic topaz," "synthetic aquamarine," etc. should not be used as these materials are not made synthetically. These names refer to either synthetic spinel or synthetic corundum.	
Asteriated stones	(1) Star due to inclusions of rutile	
	red (light to dark)	Synthetic star ruby
	blue (light to dark)	Synthetic star sapphire
	(2) Star due to etching and coating back of transparent synthetic corundum. Not to be confused with star quartz	
	red	Synthetic ruby foilback
	blue	Synthetic sapphire foilback

SPECIES	DESCRIPTION	CORRECT NAMES
SYNTHETIC SPINEL	Light purplish red	Synthetic rose spinel
	Light red	Synthetic pink spinel
	Violet-red	Synthetic almandine spinel
	Yellow	Synthetic yellow spinel
	Light green	Synthetic chrysolite spinel
	Green	Synthetic green spinel
	Blue	Synthetic blue spinel
	Violet	Synthetic amethystine spinel
	Alexandrite-like	Synthetic alexandrite-like spinel
	NOTE: See comment under Synthetic corundum	
SYNTHETIC EMERALD	Only material on market is green to bluish green in medium to dark tones	Synthetic emerald
SYNTHETIC RUTILE	Yellow (very light to dark tones)	Synthetic rutile or synthetic yellow rutile
	Red	Synthetic red rutile
	Blue	Synthetic blue rutile
	Green	Synthetic green rutile
	NOTE: The name Titania is also acceptable in place of synthetic rutile. It should be prefixed by the proper color in stones of other than very light to light yellow	

Endowment Members of the Gemological Institute of America

To insure the perpetuation of an educational institution for and by jewelers, an endowment fund of more than $50,000 for the Gemological Institute of America was established in 1941. This amount was raised through voluntary contributions solicited by a committee of the American Gem Society from G.I.A. students and graduates, and from a related group of importers, manufacturers, and wholesalers.

Both retail and wholesale divisions of the industry are represented among the donors, as can be seen from the following list of G.I.A. Endowment Members. Listing of firm names indicates contributions made by the company, whereas smaller donations were individually made by those whose names are listed.

To these men and to those firms who contributed a total of more than $50,000, the jewelry industry owes a debt of gratitude for their interest, sincerity, and foresight. The establishment of such a nucleus, as part of the reserves necessary to guarantee continuance of the G.I.A. when, and if, funds are needed to meet operating expenses, gave stability and permanency to the institution.

Since 1941 additional voluntary contributions, plus additions from operating surplus, have raised the endowment to more than $100,000. No attempt has been made, however, to increase this reserve to a sum sufficiently large that interest would materially assist in the operation of the Institute, as is the purpose of most endowment funds.

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Gemological Digests

ANALYSIS MADE OF MINING ACTIVITY IN TANGANYIKA

In the August issue of the *Diamond News* a detailed analysis of diamond production and exports in Tanganyika for the years 1948 and 1949 is made from the annual report of the Department of Lands and Mines.

It is interesting to note that Williamson Diamonds, Limited, exported four times as much as the next producer, Alamasi, Ltd. in 1948 but that this figure had increased to more than ten times as much in 1949.

In 1949 Williamson Diamonds, Limited, treated 722,524 loads of gravel from which 177,394 carats were recovered. This is an average recovery of 24.5 carats per hundred loads, compared with 43.8 in 1948.

During the year more than 76,000 carats of cuttable diamonds were exported by the Williamson firm and 97,000 carats of industrial diamonds. The cuttable diamonds averaged 312 s. or about $44.00, per carat.

If the export figures given in the report indicate correctly the nature of the production, the percentage by weight of industrial diamonds given previously for Tanganyika is incorrect in that instead of 20 per cent of industrial stones, the figure is closer to 60 per cent. Earlier figures which indicated that 80 per cent of the production was cuttable, must have given percentage of cuttable stones by value rather than by weight.

One would gather from reading the analysis in the *Diamond News* that the figures are accurate to the last stone exported, for one producer is listed with the following figures; Weight of diamonds exported — industrial, 2 carats; value 3 pounds, total number of diamonds exported, 1; total weight of diamonds exported, 1.75; total value of exports, 3 pounds.

OUR APOLOGIES TO AUSTRALIAN READERS

In the winter issue of *Gems & Gemology* two errors have been noted in reporting information from Australia.

First, we erroneously stated that the sale of the Pandora Opal was handled by Jack S. Taylor of Sydney. We cannot explain how this misinformation crept in, but it is just one of those things which occasionally occur in even the best edited publications. Our apologies to Jack Taylor for reporting something which was apparently only an editorial hallucination!

Likewise, adding coals to the fire, in the same issue order was reversed in listing the three first positions of those who qualified in the 1950 diploma examination for Fellowships awarded by the Gemological Association of Australia. These should have been listed in the following order: K. N. S. Hall, G. A. Tombs, and B. J. Skinner.

Kay Swindler

CALIFORNIA JADE DEPOSITS REPORTED IN DETAIL BY DIVISION OF MINES

Review of *Nephrite Jade and Associated Rocks of the Cape San Martin Region. Monterey County, California* (Special Report 10-A), *Jadeite of San Benito County. California* (Special Report 10-C), and *Nephrite in Marin County, California* (Special Report 10-B), Division of Mines, Department of Natural Resources, State of California.

Although jade has been an important gem for centuries, the material first used by the Chinese was nephrite, apparently originating chiefly from Chinese Turkestan.

Slightly more than 150 years ago, the fine Burmese jade deposits came to light and from that time provided the major source of fine material used by the Chinese.

Nephrite jade is a variety of the isomorphous tremolite-actinolite series occurring in the amphibole group of minerals. Tremolite is usually white in color and like actinolite occurs in bladed crystals. Actinolite contains ferrous iron, replacing a portion of the magnesium of tremolite. Tremolite is a calcium magnesium silicate, whereas actinolite is a calcium magnesium iron silicate. A characteristic of the amphibole group is its hydrous nature in contrast to the pyroxene group of which jadeite is a member.

Nephrite is known in a number of occurrences throughout the world. In addition to the original source in Chinese Turkestan, it is also found in New Zealand; Alaska; Lander, Wyoming; Siberia; and Europe. Until recently jadeite has been known in gem quality only in Burma. However, the presence of jadeite artifacts in Mexico and Central America have long interested scientists because of the failure to find original sources.

Jadeite is a sodium aluminum silicate—a member of the pyroxene group. As in the case of amphobiles, pyroxenes tend to grade into one another in an isomorphous relationship.

Nephrite jade of good quality was discovered in Lander, Wyoming, for commercial purposes at least, less than twenty years ago. Since that time in the last few years, reports of jade discoveries in California have been frequent. Nephrite jade of particular interest scientifically and to amateur lapidaries has been reported from the coast of southern Monterey County, near Porterville, in Tulare County, near Petaluma in Marin County, and also from Mendocino County as well as from other localities.

According to the report on the jadeite of San Benito County, the occurrence was first noted in an unpublished thesis submitted by R. C. Mielenz to the University of California in 1936. Jadeite was reported in 1950 in the Clear Creek area by Bolander who was unaware of the work of Mielenz.

In all jade occurrences in California reported in the three California Division of Mines publications, jade has not been of fine gem quality. In all cases, both California nephrite and jadeite have been associated intimately with serpentine deposits which fact has led, because of the widespread occurrence of serpentine in California, to the conclusion that many more jade discoveries are likely to be made in the years to come.

The jadeite of San Benito County was first noted by Bolander in boulders in Clear Creek. Soon discoveries of jadeite in place were reported by prospectors. The serpentine of the area lies in an oval body approximately four by twelve miles. While eight large exposures were found in canyons in Clear Creek, it is assumed that there are many more. Some of the outcrops are large masses, in one case reported to be 50 x 200 feet.

An interesting sidelight on the toughness of jadeite is contained in the following quotation from the report: "Although an effort was made to secure representative samples, some outcrops did not yield samples, even to heavy sledging." The report states that in close proximity to a jadeite body, the serpentine is ". . . extremely sheared, darker in color, the surface dull, and appears to have been altered." The jadeite rock is reported to crop out as isolated knobs and although most of it is massive, in places it is blocky, sheet-jointed or cavernous.

From the geology of the area and the

mineralization, the authors infer that the serpentine was either emplaced in the solid state or formed by alteration of a previous basic rock. Later deformation took place with most intense fracturing and brecciation taking place at the contact between the serpentine and schist. Fluids that were probably residual from the process which formed serpentine entered the brecciated zones, forming many mono- or bi-mineralic bodies in the serpentine, of which jadeite is one.

The San Benito jadeite in most cases is banded in dark and lighter green with a tendency toward white, coarsely crystalline jadeite in the center of the masses. The authors conclude that "the jadeite deposits studied in San Benito County, California, will probably not yield high quality gem material but will be a source of attractive and interesting specimens for collecting and polishing."

There have been several other jadeite discoveries announced in California from Mendocino, San Luis Obispo, and Sonoma counties, but complete reports on them have not been published as yet.

The first of the two nephrite occurrence reports concerns deposits along State Highway No. 1 on the coast about midway between Monterey and Morro Bay. The nephrite was first noted as boulders and pebbles on the beach at that point and then discovered in rock at several places in the seaworn cliffs within a two mile stretch of coast. The Marin County occurrence, also in serpentine, is on the east side of Massa Hill about five miles southwest of Petaluma.

In Monterey County, the nephrite occurs as pods in a gray schist in contact with serpentine. In Marin County the nephrite occurs in two types of deposits; in thick short lenses in sheared serpentine and in contorted lens-veins and veins up to about one inch in sheared and massive serpentine. The nephrite in the latter deposits varies from "pale olive green through pale bluish green to dark blue-green."

The large interest developed in the jade of California in the past few years is due largely to the interest in gems and minerals developed in the many amateur lapidary and gem and mineral groups in California. In all probability many more deposits will be discovered in the next few years, some of which may produce fine gem material.

Richard T. Liddicoat, Jr.

JADE ARTIFACTS FOUND IN CALIFORNIA BY ARCHAEOLOGICAL SURVEY

The discovery of jade artifacts in a jade shellmound in California was recently reported by Dr. Robert Heizer, Director of the University of California Archaeological Survey during an investigation by an expedition from the University.

The ancient village site, or shellmound, was found to have two levels and it was estimated that the deeper was occupied approximately 2,000 years ago and the one on the higher level about 1,000 years later.

In the earlier occupied excavation, only one jade tool was unearthed. Occupants of the later shellmound were, however, well acquainted with the useful properties of the local nephrite. From approximately 4,000 cubic feet of excavated midden, 46 nephrite hammerstones and hundreds of nephrite cooking stones were removed. The hammerstone, being of tough material, could withstand the shock of battering better than any other stone found in the vicinity, and the fist-size cooking stones apparently could also withstand heat better than any other local stone.

Gemological Digests

UNGAVA CRATER NOT SOURCE OF DIAMONDS

According to a statement in the *Journal of Gemmology,* published by the Gemmological Association of Great Britain, the world's largest crater recently discovered in Ungava Territory, in the extreme northwestern part of the Province of Quebec, has been proved by competent scientific examination to have resulted from the impact of a meteorite striking the earth approximately 3,000 years ago.

This disproves the original assumption that this huge crater is similar in nature to the diamond pipes of South Africa and that it might be the source of diamonds found in various sections of the United States, presumably carried from their source during the Ice Age. Although the theory that diamond pipes exist in Canada has not been discounted, their location still remains a mystery.

QUESTIONABLE CLAIMS MADE FOR SYNTHETIC RUTILE

The fantastic advertising claims made for synthetic rutile, under an endless variety of names, are becoming increasingly annoying. On its own merits, synthetic rutile is a beautiful material when properly cut. To claim, as many periodical advertisers have done, that it is nearly as hard as diamond and that it is much more brilliant than diamond, is not only incorrect but totally unnecessary.

Other factors being equal, the refractive indices of 2.61 and 2.90 for synthetic rutile, compared to 2.42 for diamond, would make synthetic rutile more brilliant. However, simple comparison of a well cut diamond with a well cut titania will show the other factors are not equal, and that the diamond gives more brilliancy.

The factors that determine brilliancy of a material include in addition to refractive index, its transparency as well as cutting proportions and the optical flatness of the polished surface.

Synthetic rutile, even in its palest yellow form, absorbs a significant proportion of the spectrum so that it does not return to the eye of the observer the high proportion of white light returned by diamond. Furthermore, the tremendous dispersion of titania means that much of the light totally internally reflected does not return to the eye as white light but as spectral colors. In addition, it is difficult, if not impossible, to polish surfaces on titania to produce a luster approaching that to be expected from a material of such high refractive indices. Diamond takes a higher polish.

The highest claim by the actual manufacturers of synthetic rutile place the hardness of annealed boules as near that of quartz. We have yet to encounter one not easily scratched by chalcedony. It is our contention that titania has a sufficient beauty to become an important gem material in its own right if properly sold and not consistently compared to diamond, in comparison to which in many respects it falls far short. We are at a loss to understand why an individual summarization of its good points — without the obnoxious and false comparisons — would not do much to add to its importance as a gem material.

R. T. L.