In Search of the Precious Stone

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by

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MAN'S interest in Gems has not been confined solely to their use as a medium of adornment. The ancients invested them with certain talismanic qualities, a belief which has spanned the intervening centuries and which even modern science has failed to dispel entirely, as attested by the popularity of birth stones.

Jewels have been found in the tombs of prehistoric peoples, extinct long before the civilization of the Incas, of the Pharaohs or of the Montezumas prospered, and ever since, men have toiled and fought, stolen and lied for them.

Springing from a line of lapidaries as I do, the attraction which precious stones hold for me, unlike my fondness for olives, is a matter of heredity rather than an acquired taste. At the age when my playmates were reading fairy tales I was avidly devouring volumes about

Gems. I clung with breathless interest to every word of the tales of privation, adventure and romance which my uncle wove about the dull-colored little stones he brought home. As, under my brother's masterful hand, they shed their rough coats and were transformed into scintillating globules of crystallized color, my admiration of the miracle was tempered by my envy of the skill which had made it possible. I impatiently awaited the time when I too might take my place at the wheel and conjure forth the charm and beauty which nature had so subtly concealed within the lifeless pebbles. At last the fated day arrived, when I was twelve years of age. Under the guidance of my uncle, I cut my first Opal.

The initial estimate I formed of my ability as a cutter was destined to a depreciatory revision when I had learned more about the intricacies of the craft. A Gem in the rough is to a lapidary what a plot is to a writer—both must be treated in the manner best calculated to accentuate their good points. The skilled artisan should not only be capable of recognizing the inherent possibilities of a stone but he must also be able to bring them out. The fact that each stone has its own peculiarities leads to appreciation of the versatility which is necessarily one of the qualifications of an expert lapidary.

My experience and the years progressed apace and I became proficient in my chosen calling. In the application of my profession that spark of romance which had been responsible for my childhood interest in stories of travel was fanned into a consuming flame by the opportunities for adventure which the search for the Gems I handled daily would afford. The stones which intrigued me most were the Black Opal, the Sapphire, the Star Sapphire, the Ruby, the Cats Eye and the Emerald, all of which are accorded prominent niches in the fashion salon of the present day.

The Black Opal had been discovered but a short time previous in Australia and the popularity which greeted it was the last straw. I could resist the lure no longer and accordingly set out upon a quest that ultimately carried me to Australia, Siam, Burma, Ceylon and many other far and unfrequented corners of the globe.

Embarking in England I had an interesting and eventful voyage, nearly around the world, to Sydney, the capital of New South Wales, on the southeastern coast of the Island Continent. Walgett, four hundred miles to the northward, was an outpost of civilization, and there the railroad ended. From that point it was necessary to proceed on horseback. The sixty mile journey to Lightning Ridge, where

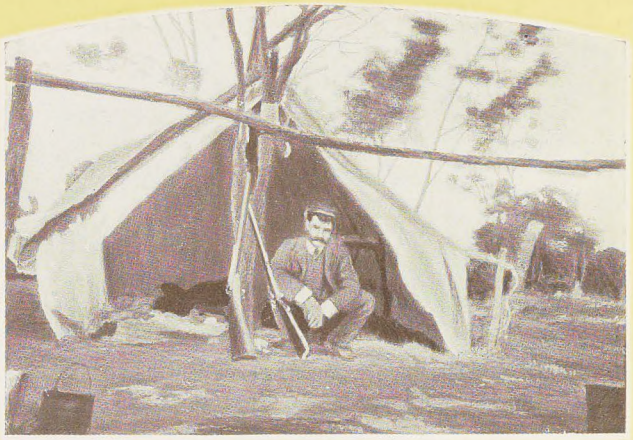
Opal miners

the Black Opal mines are located, was made amid the myriad wonders of the Australian bush. The horses picked their way with difficulty through the tangled undergrowth which clutched viciously with thorny fingers at man and steed. The plumelike fronds of the fern trees quivered and the cabbage palms swayed listlessly in the gentle breeze. Scattered over the terrain, beeches and cedars stood out above the surrounding brush like beacons above a rolling sea. Rabbits and other small game scurried frantically to cover and birds rose in flocks from beneath the horses' hoofs, uttering shrill cries of protest against our incursion. At rare intervals man's battle to

Opal

wrest a living from the land was evidenced by sheep farms, nestling amid the dense tropical scrub. This district, one of the most delightful in Australia, was still untrammeled by the march of the Empire.

The camp at Lightning Ridge consisted of a group of tents and a few shacks. Accommodations were of the crudest sort and I established my headquarters in a tent, shared with a miner. While at Walgett I had heard tales of numerous holdups and not caring to augment the natural dangers of a trip through the bush by the risk of robbery, I deposited the large sum of cash I had brought from Sydney in the town's single



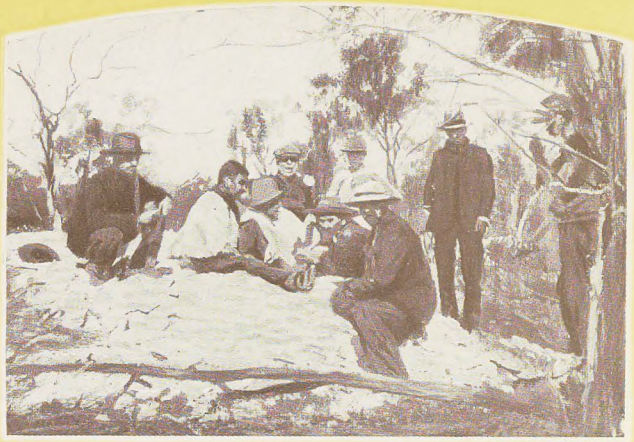
Opal buyers' camp

bank. As a result of that decision I was the first man to pay by check at the Lightning Ridge mines. Commercial missionaries have their troubles as well as do religious ones. An amusing incident in connection with my transaction will serve to illustrate the point.

Having selected a considerable parcel of Opals I tendered the miner from whom I was purchasing them a check in payment. He examined it skeptically and it was only after I had nearly exhausted my patience and vocabulary that he could be persuaded to accept it in lieu of cash. A group of miners who had witnessed the scene while waiting to deal with me

lost interest immediately when they saw that their companion had received a slip of paper for his Opals instead of currency. Neither argument nor pleading availed. They were adamant, and it was not until two days later, after one of their number had gone to Walgett and verified my statements, that I was able to procure any more stones.

While at Lightning Ridge I had an experience which I never recall without a flutter. One day I decided to go shooting. I deemed it advisable to work toward the west in order that I might have the setting sun on my back as a guide during the return trip but the miner whose tent I was sharing suggested another route as being more likely to afford me a shot at a kangaroo. I followed his advice and was rewarded by the promised kangaroo and some rabbits. It was getting late and if I was to avoid being overtaken by nightfall it was imperative that I start back. Whether I was excited over my first kangaroo or whether I was too engrossed in the beauty surrounding me I do not know, but at any rate I forgot that I had altered my original intention, and proceeded away from the sun. After trudging for a long time without encountering any familiar objects the realization that I was "bushed" burst upon me—in other words, I



Opal miners selling their day's find

was lost in the tangled brush with darkness fast approaching. Through some psychological phenomenon it seems that in a crisis we are reminded of the most unpleasant things in connection with our particular predicament. My case was no exception and I recalled in vivid detail the story of a miner who had been "bushed" the week previous and was found dead from thirst forty miles from camp. The thought of the poor chap's fate and the excruciating torture which must have preceded it, filled me with panic and I immediately became obsessed by a mad desire for water, as commonly occurs when men realize that they are "bushed." Wandering in circles, mo-

mentarily suffering more and more from thirst, I plucked handfulls of grass which I chewed in an attempt to allay my anguish. Exhausted, mentally and physically, I was about to lie down when I heard the faint tinkle of a bell. This imbued me with fresh courage and I set out to locate the source of the sound. At nine o'clock, scratched and bleeding from the briars, I stumbled upon a horse with a bell around its neck. Never before had the sight of a horse been so welcome for his presence might portend the proximity of human habitation or, if things came to the worst, men had lived on horseflesh. Darkness had spread its ebon pall over the wilderness and I decided to camp where I was until daybreak. Night-birds called to their mates and my active imagination filled the brush with the forms of prowling beasts. As a result I was unable to sleep and in that, fate was kind to me, for about midnight the penetrating tones of an Australian "coo-ee" were borne to me upon the wings of the night breeze. I fired my rifle in response and the horse bolted, but fortunately my signal had been heard and finally a black tracker appeared. My tent-mate, worried over my failure to return, had spread the alarm and as a result four hundred miners set out to beat the brush in search of me. We reached camp early next morning.

Perhaps it is base ingratitude to question the motives of my rescuers but I have since debated whether their solicitude for my welfare was not prompted more through the fear of losing a good customer than it was through any spirit of brotherly love.

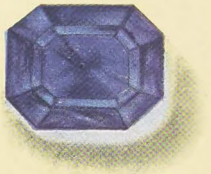
During my two weeks' stay I purchased about $50,000 worth of rough stones. The return journey to Walgett was negotiated without mishap, riding at night, under the protection of an armed escort.

The fact that I had been fortunate beyond my fondest hopes in obtaining such wonderful specimens of Opals whetted my desire to continue the search and I accordingly decided to proceed to Siam in quest of Sapphires. As the steamer ploughed northwestward across the Indian Ocean, the sea was an ever-changing marvel of beauty. It resembled a huge casket, into which the jewels had been cast in promiscuous disarray. Jade and Sapphire, Turquoise and Emerald, Aquamarine and Amethyst—all were inseparably mixed by nature's magic hand. Schools of flying-fish emerged, glided through the air for a brief moment, and then, with a splash that rippled the ocean's calm surface, were gone into the depths from whence they had come. Porpoises, their backs as sleek and shiny as velvet, sported about the bow of the ship.

Rough Sapphire

As the sun, like a glowing disc of molten copper, sank into the western sea, one involuntarily awaited the hissing steam which accompanies the immersion of hot metal in water. The afterglow, touching the detached fragments of cloud, transformed them into bits of Opal floating against an iridescent background of pink, orange, and blue, marvellously blended. After ten days spent amid these pleasant surroundings we steamed up the Menam River to Bangkok, the capital of Siam.

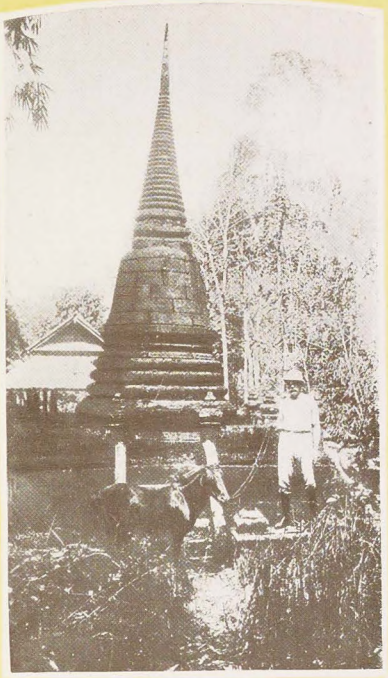
Bangkok presented a singular yet imposing appearance. Here were balconied minarets, slender and delicately modeled, ornate in lacquer and gilt which refracted the rays of the



Cut Sapphire

tropical sun with dazzling brilliancy; here were pagodas, many-storeyed and tapering to needle-like points, with eaves whose corners curled up as does the toe of a Turkish slipper; here were houses with tiled roofs of brilliant colors. Over all was an air of mystic antiquity, unalloyed through contact with Occidental progressiveness.

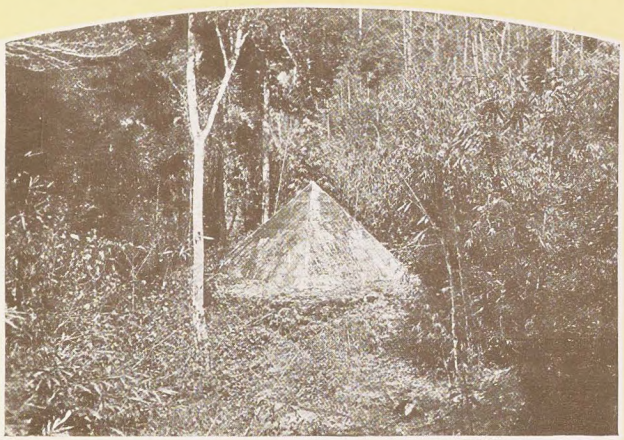
From Bangkok I took a coasting-steamer to Chantabun, one hundred and twenty-five miles to the southeastward. The Sapphire mines in the Pailin District are three days' journey through the jungle from Chantabun. This trip, made on horseback, indelibly impressed itself upon my memory. The native guides, their ugliness increased by their teeth, blackened through incessant chewing of the eternal betel-nut of the Orient, led me along a path which would have been indiscernible to one unfamiliar with its existence. The arched branches of the trees were festooned with vines and sinuous creepers which necessitated lying flat along the horses' backs if any progress was to be made. At times the members of the party were concealed from one another by this screen of hanging vegetation. No refreshing breeze penetrated the matted foliage to dissipate the unwholesome emanations of the damp ground, untouched by the purging



Native temple near our first night's stop

beams of the sun; the atmosphere was heavy with humidity and the temperature ranged above one hundred degrees, day and night. Eight hours of riding, ducking and dodging, brought us to a dak bungalow or rest-house, where we were to spend the night. This bungalow was a bamboo shelter built upon a platform elevated about six feet above the

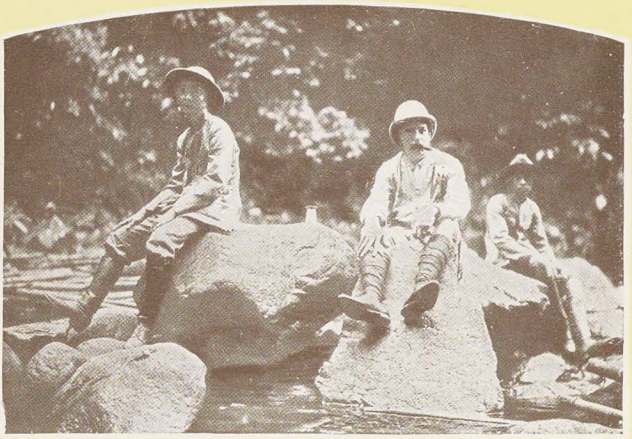
ground to discourage any undue familiarity upon the parts of cobras, wild pigs, tigers or other rapacious beasts which roamed through the Siamese jungle in great numbers. The dak bungalow was in the middle of a small clearing upon all sides of which the forest was sending forth new growth, just as an army gradually closes in upon a besieged city. Resplendently-plumed birds flitted in and out among the lush bamboo and pendent vines; daintily-tinted orchids vied with gaudy flowers for the favor of the great butterflies which floated from one to the other like animated gems. The tout ensemble formed a never-to-be-forgotten picture of tropical luxuriance. It seemed a crime that the appreciation which such beauty merited should have been withheld owing to the oppressive and enervating heat. The intentness with which we scanned the bordering thickets and the care with which we clung to our rifles were in no way abated through the recollection of a tomb we passed in which were interred the remains of a miner who had been killed upon the spot by a tiger. Finally, hot, tired and thirsty we reached a water-hole. After thoroughly satisfying our thirst we filled the deer-skin water-bags and bathed our heads and hands in the ice-cold water. Revived in body and spirit we proceeded and fifteen miles from the dak bungalow



Tomb of sapphire miner who was killed by a tiger in the jungle

we arrived at a river across which we were ferried in sampans while the guides swam the stream with our horses. On the evening of the third day we reached the mines.

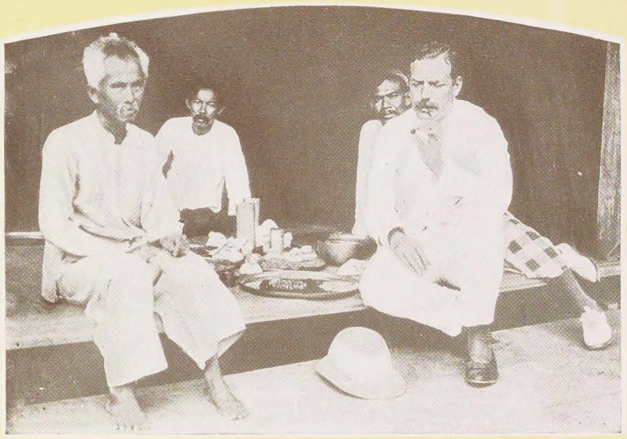
The following morning I inspected the Sapphires and then began the strangest bargaining-session to which I have ever been a party. Many of the miners are Burmese immigrants and it had been necessary for me to thoroughly acquaint myself with their methods in order to trade with them. Buyer and seller clasp hands. The miner throws his panung or waist-cloth over the hands, thus concealing them from any witnesses who may be present. The bargaining is conducted in absolute silence,



The water hole where we obtained water for three days journey

prices being indicated by pressure upon the joints of the fore and middle fingers in accordance with a code which I had previously learned in preparation. In this way the bystanders are prevented from knowing whether or not a deal has been consummated. The transfer of stones and cash takes place later.

For five days I squeezed the hand of a Burmese miner and had my own pressed by him in return. We were playing for high stakes and it was with a feeling of satisfaction that I ultimately felt the pressure which indicated that I had won. As a result I acquired in return for $200,000 in note currency, one of the finest collections that ever left the mines. Included in it was the Sapphire par excellence



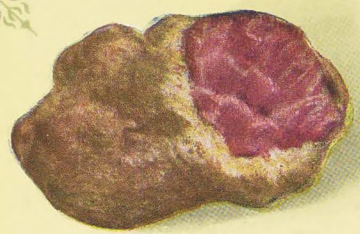
Buying sapphires at a miner's camp

of the Siamese mines. It had been given to the man from whom I bought it, fifteen years previous by his partner, upon the latter's deathbed, to be held in trust for his son. Through a stroke of good fortune I had been able to save the life of the trustee's grandson by the aid of my medical-kit and as a token of appreciation he sold me the stone for $10,000. The following day the old man died and although the superstitious natives interpreted his demise as a retributory punishment for having violated his trust I have often wondered if, in my eagerness, I had not worked his joints too strenuously.

From Siam I turned my attention to the famous Ruby mines in Burma. To those unversed in mineralogy it is difficult to conceive Sapphires

and Rubies belonging to the same species. Such is the case however, as both are corundum and possess similar physical characteristics—color excepted. They rank in hardness second only to the Diamond. Carat for carat Rubies of the first quality are rarer and consequently more valuable than Diamonds of a corresponding grade. No other stone increases as rapidly in value in proportion to increase in weight as does the Ruby. Dark red Rubies are found in Siam and purplish ones in Ceylon but Burma alone may claim the wonderful Pigeon-Blood Ruby.

To reach the mines I went first to Rangoon, the capital of Burma. The outstanding feature of Rangoon is the Shwe Dagon Pagoda, glittering in its golden armor. In passing, a few words descriptive of this Buddhist holy-of-holies might be apropos. Erected in 588 B.C., according to tradition three women were buried alive during the rites which accompanied its inception. The Pagoda, 370 feet high, is built in the center of a vast terrace 166 feet above the ground. Upon its summit is a sort of network headpiece dangling with bells. This structure is jewel-encrusted, the upper dome being covered with eighth-of-an-inch-thick plates of solid gold, and the lower part overlaid with burnished gold-leaf. Above all



Rough Ruby

floats a banner studded with gems worth more than $1,000,000. The Shwe Dagon is surrounded by some fifteen hundred minor pagodas which, with their garish trimmings and wax-work-show of alabaster images, impart the atmosphere of a fair to the entire scene.

The narrow, tortuous streets of Rangoon swarm with yellow-robed Buddhist priests, grotesque in appearance, their heads and eyebrows shaven in accordance with the mandates of their creed. The prevalence of holy men in Burma is due to a custom whereby the sons of the better families devote a certain portion of their lives to the priesthood, just as, in more civilized countries, young ladies attend convents with a view to culture and education.

Cut Ruby

Mandalay, immortalized in verse by Kipling, was reached after an eighteen-hour rail journey to the northward. There I embarked upon the Irawaddy, one of India's great rivers. All day the quaint steamer nosed its way cautiously upstream, following the twistings and turnings of the tortuous channel. The overhanging ferns caressed the surface of the sluggish stream and each feathery leaf of the palms lining the banks found its counterpart mirrored upon the glassy surface of the backwaters. Huge rafts of teak logs, manned by Burmans, drifted slowly by, upon their journey to the sea. Waterfowl, disturbed in their quest for fish amid the bending reeds, took wing with a whirr calculated to gladden the heart of the sportsman. When night settled upon the jungle it was necessary to drop anchor owing to the dangers attending navigation in the dark. The moon, red and hot-looking, peered from behind the distant hills and, as if satisfied with what it had seen, climbed into the star-dusted heavens to be reflected later upon the river's expanse in all of its silvery splendor. I reached Thabeitkin the following morning.

Thabeitkin is a small village and impresses one with the belief that it is clinging desperately to the river-bank lest the jungle, encroaching upon the three remaining sides, succeed in

crowding it into the stream. When I arrived, the village was in a state of excitement bordering upon panic over the recent destruction of one of the inhabitants by two man-eating tigers. These beasts are held in such mortal dread by the natives and so many terrifying tales are told of their depredations that I climbed into my dak bungalow with alacrity when it grew dark and I freely confess that I spent a very restless night. The following day I was so engrossed in preparations for my trip to Mogok, where the Ruby mines are located, that all disturbing thought of the predatory felines was banished. The British Government has connected Thabeitkin and Mogok by an excellent road, seventy miles in length. The journey is a gentle ascent and the scenery, interesting for the entire distance, is particularly beautiful when nearing Mogok from which point a panoramic view of the surrounding country is obtained. Mogok, being about five thousand feet higher than the river, has a climate delightfully cool in contrast to the heat prevailing in the valley. The mining district comprises about two hundred square miles and the mines, controlled by the Burma Ruby Company, are worked in accordance with the most modern practice, the surrounding hills being gradually leveled in the course of operations. Through a coincidence the finest Ruby ever found in these

mines was discovered on Armistice Day, 1918. It was christened "The Peace Ruby" and was purchased by a native merchant for $100,000. He later sold it to an Indian Rajah. The choicest Rubies are sent to the London market and the Company holds weekly sales at which the native buyers purchase the balance of the output. After crudely cutting the stones thus obtained the dealers dispose of them to outside interests.

During my return trip from the mines I was afforded an opportunity to test the theory of psychologists to the effect that our subconscious minds control our involuntary actions and the result seemed to verify their contention. When we had arrived within about two miles of Thabeitkin I decided to walk the balance of the distance alone in hopes of bagging a bird or two for breakfast. I was proceeding quietly when a peculiar rustling in the bushes beside the road attracted my attention. Man-eating tiger!—such was the thought that darted through my mind, bringing with it the recollection of the tragedy at Thabeitkin and my former fear, not dead but sleeping, sprang into life with renewed vigor. I felt instinctively that nothing but a tiger could have made that sound. Before I could budge the tomb-like silence of the jungle was shattered by

a crash as of some heavy body precipitating itself through the underbrush. I then comprehended what the writers of "thrillers" mean when they say: "His hair stood on end." My brain refused to function; my feet were rooted to the ground; my eyes were hypnotically fixed upon the spot from whence the tawny brute was about to spring. I stood thus transfixed, with beads of cold perspiration trickling down my forehead for what seemed an age but was, as a matter of fact, a few seconds, before the bushes parted and there appeared—not the striped form I had expected but the tusks of an elephant. Another moment and the chain which he wore upon one of his hind legs became visible, branding him as a tame work-beast employed by the natives in the transportation of teakwood logs. I suddenly went as limp as a balloon tire which has formed a mesalliance with a nail and before my legs had received the bulletin flashed from my mental control-station I was establishing new records for all distances up to and including two miles. Whether my failure to conduct myself in a normal manner immediately after the truth was discovered was due to exceptionally fast feet or to an unusually slow brain, is a matter of conjecture. At any rate I barely missed going right through the village and into the river.

Being desirous of adding to my collection of Sapphires I turned my attention to the mines of Ceylon. Approaching Ceylon across the Bay of Bengal the empyrean dome of the firmament is apparently supported by the peaks of the mountains which rise sheer from the ocean's depths. As the intervening distance decreases, more and more of the island becomes visible until finally, cloaked in luxuriant tropical foliage, framed by a beach of glistening white sand and set in the midst of an indigo sea, it resembles an Emerald mounted upon a slab of Lapis Lazuli.

Much of the Sapphire-bearing ground in Ceylon is planted to rubber trees. The native miners lease sections from the plantation owners and sink shafts between the trees, frequently going down to the depth of seventy feet in order to cut the helam or Sapphire-bearing stratum. When that has been accomplished they drift along the helam by digging horizontal galleries. The loosened earth is carried to the shaft and raised to the surface by the aid of a windlass. Here it is piled until a sufficient quantity has been accumulated to warrant washing. The washing is performed in baskets and the operation is supervised by the owner who personally collects the gems as they are exposed. The stones are removed

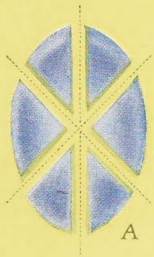
to the home of the plantation-owner for safe-keeping and once a month they are sold. The aphorism that self-preservation is the first law of nature was aptly demonstrated at one of these sales. The barefooted Singalese buyers were grouped in a circle heatedly bidding for the stones. One of their number discovered a scorpion too close to his feet for comfort and, being a public-spirited individual, he informed the community of the peril by shouting: "Scorpion!" at the top of his lungs. A story is told of a fleeing negro who heard the bullet of a pursuer twice—once when it passed him and again when he passed it;—well, he was standing still compared to those Singalese. Scattering gems in all directions they headed for the jungle where the last one arrived just in time to hear the warning word the second time. The intruder was killed and his mangled form exhibited to the natives as, one by one, they gingerly returned. Even that assurance failed to revive the enthusiasm of the assemblage in Sapphires and the uneasy manner in which the buyers scrutinized the ground during the balance of the sale bespoke lack of confidence in the famous words of Ethel Barrymore: "That's all there is. There is no more!" Needless to say, that particular sale was not a success financially.

Rough Star Sapphire

Star Sapphires, native to Ceylon and Burma, are found in the same beds as Sapphires. They possess a property of which even many jewelers are ignorant, i.e., no matter into how many parts a Star Sapphire may be cut each fragment will contain a six-pointed star of elusive light. I also acquired some fine specimens of Cats Eyes, which are steadily increasing in popularity.

As previously indicated, success in the gem business is largely dependent upon the buyer's ability to accurately appraise the merits con-

Cut Star Sapphire



Star Sapphire showing cleavage through star

Small stars cut from large Star A

Cats Eye

cealed in the rough stones and my early training and experience in that particular fitted me admirably for the task which confronted me upon my trip. In the course of my career I have seen unscrupulous dealers take advantage of many men whose business should have rendered them immune to fraud, to mention nothing of the cases of people in whom ignorance in the matter of gems was excusable.

Upon my return from the Orient I went to South America to petition the Colombian Government to grant me an option which would enable me to work the Muzo Emerald mines, near Bogota, the country's capital. These mines, which at that time had been inoperative for a number of years owing to litigation, produce Emeralds far superior in quality to those found in the Siberian or other fields. I also desired to purchase a magnificent collection of Emeralds which the Government was holding in its vaults. The Emerald is a gem which has figured prominently in the

Rough Emerald

annals of romance and tragedy throughout the ages. The ancients ascribed to it the power to sharpen wits, confer riches and enable its owner to foretell future events, but modern society places its stamp of favor upon the Emerald for the more practical and self-evident reason of its beauty. Many persons of un-

Cut Emerald

questionable discrimination and refined taste prefer the fires which smolder in the Emerald's depths to the icy austerity of the Diamond. My Colombian trip proved interesting and profitable but the incidents which made it so may not be told at this time.

The foregoing are but a few experiences gleaned during my wanderings into distant lands, not only that I might obtain the jewels, but that I might also sense the thrill which comes from searching them out in nature's hiding-places. To me a gem is not merely a cold, inanimate bauble. It symbolizes years of somebody's life consecrated to obtaining it; it is moist with the sweat of labor amid untold perils and under tropic sun; it is warm with the life-blood of its discoverer, and as I hold it upon the palm of my hand, I can again feel the pulse of that man leap as it must have done when he first beheld the fruit of his toil. Can you blame me for being fascinated?

FINIS

The Cutting and Polishing of Gems

The art of cutting precious stones can be traced back through the centuries. In 1285 a guild of gem cutters existed in Paris; about a century later there were lapidaries at work in Nuremburg and it is likely that the craft was followed long before this time. To Ludwig Van Berguen, of Bruges, is given the credit of first cutting diamonds with a symmetrical arrangement of facets. This was about 1460.

It is difficult to get precise information concerning the tools of the early gem cutters, but inasmuch as those of modern lapidaries are so very simple, it is probable that there has been little change in the instruments used in the trade. But while few changes mark the equipment of the modern lapidary, yet great strides have been taken toward greater skill and finesse on the part of the workers in the craft and in the display of judgment that makes for getting the utmost in beauty and value from the rough gems.

In no other craft is the mental quality of judgment as important as in that of the lapidary. In the cutting of a valuable gem from the rough stone the slightest error in judgment may mean a vast difference in the beauty of the finished gem and a difference of many dollars in its value. Next to judgment the qualities that are of value in a lapidary are experience and skill and a trained delicacy of touch.

It will be interesting to the buyer of gems to know the routine of carrying the rough stone through the various processes that finally produce the finished polished gem as it is found at the jewelers. It may be well to explain here that the cutting and polishing of diamonds is a special craft—the lapidary who works in diamonds seldom concerns himself with other gems. It is also interesting to know that with the diamond to obtain brilliancy is the prime requisite, while with most other gems the matter of color is given precedence and brilliancy is a subservient quality.

The cutting and polishing of the diamond is very largely a mechanical, mathematical application of pressure and friction, while most other gems are manipulated with a human delicacy of touch and a perfection of technique which constitute the whole secret of success in gem cutting. The cutter of gems other than the diamond has a license for following his own ideas and he may alter or modify the cutting to bring out the peculiarities of any stone and depart as far as he wishes from the conventional. I shall describe here the various processes through which a rough gem stone passes.

The best judgment of the lapidary is called into play in his first consideration of the rough stone, for it is here that his experience and wisdom provides for getting the greatest measure of beauty and value from the uncut gem, and for minimizing waste and loss of weight. After passing upon the characteristics of a rough stone and deciding upon the method of getting the most from it, the lapidary, if the gem requires it, then puts it through the process known as "slitting," should this be required.

This process of dividing the rough stone is accomplished by holding it against the edge of a thin metal circular revolving plate. The biting edge of this plate is due to

the diamond dust which it contains. The delicate operation of "slitting" provides pieces of the stone in suitable sizes for further working. If the gem is to be faceted it is then further fashioned toward the shape it is destined to assume on a flat, horizontal or vertical revolving wheel. In order to facilitate handling each individual gem is then mounted with cement on the end of a tiny holder of wood. This holder looks very much like the ordinary pen holder. In this operation the extreme of judgment is required and considerable latitude is given the operator that he may bring out the individual characteristics and beauty of each gem.

After the faceting is complete the gem is still dull, colorless and uninteresting, and is now passed on to the polisher, whose work it is to bring the utmost in brilliance and color to the surface of the gem. The polisher is usually a man who has no other connection with the gem than in polishing the work of the cutter. The work of the polisher is more mechanical than that of the cutter, but it is work of great delicacy nevertheless. The polisher must brighten and polish the facets, but in no way must he enlarge the tables or change the angles of the gem as designed by the cutter. The gem in the hands of the polisher may bring to light a number of faults—a tiny flaw may grow larger, an edge or angle may chip or a vein prove troublesome, and it requires a real craftsman, an operator with an exquisite nicety of touch, a man of infinite patience to carry the work of the cutter to completion and to do it with the least investment of time.

The discs used in polishing are similar to those used in cutting, except that instead of using an abrasive substance on the surface a variety of polishing materials, such as Tripoli or Rotten Stone is used. The discs used in both

cutting and polishing are made of various materials, depending upon the peculiarities and hardness of the gem being handled. They are made of iron, brass, copper, lead, gun metal, bell metal, tin, pewter, etc. For polishing Cabochon gems vertical wheels of copper, iron, wood, leather and felt are also used.

Concerning Gems

Few things that man has made use of in his evolution from barbarity to civilization have so much of romance, superstition and fascination woven about them as have precious stones. It is probable that the same subtle lure of a beautiful gem, which even the most matter-of-fact man or woman knows, led Adam and Eve, when the world was young, while they inhabited the Garden of Eden, when not busy with its fruits, to gather certain bright pebbles, which, saved and prized, became the first precious stones of history.

As far back toward this date as written accounts take us, we find jewels playing an important part in the history of the world. There were the twelve stones, each the symbol of a tribe of Israel; also the twelve stones of the High Priest's breast-plate. In Ezekiel, the covering of the King of Tyre was described as containing nine precious stones. Each of the Apostles was associated with a precious stone. In Revelation, John describes twelve precious stones in connection with the Heavenly City. The histories of Egypt, Greece, and Rome, and more modern countries, often refer to some important crown jewel, or otherwise famous gem.

PHYSICAL PROPERTIES

Long experience in handling gems gives one the ability to tell most precious stones at a glance, but even the experienced lapidary is often misled. (This applies especially to Synthetic Stones which require expert knowledge to detect. I have made a special study of these.) Precious stones possess many unique physical distinctions, which enable one by certain tests to be positive of their identity. Among these properties are the shapes of the crystals in which they are found, the manner in which they cleave or split, the way in which they transmit light, their lustre, color, hardness, specific gravity, manner in which they are acted upon by light, their condition when heated, their electrical properties, and their appearance under the X-Ray.

CRYSTALLOGRAPHY

All natural crystals of gems are divided into six systems—isometric, tetragonal, hexagonal, orthorhombic, monoclinic and triclinic. While very valuable before the stone is cut, this means of identification is useless afterwards.

CLEAVAGE

Cleavage is that tendency which some substances have of parting in some directions more easily than in others. In minerals of a crystalline nature this always bears a definite relation to the crystal formation of the mineral and is therefore another useful means of identification, not only because of the angle of the cleaved faces, but also because of the nature of the cleaved surface. Some stones such as Spodumine, Diamond and Topaz show a distinct cleavage, while others like Quartz, Garnet, etc., have the tendency to break almost, or just as easily, in any direction. This is called imperfect cleavage.

FRACTURE

The nature of a fractured surface of a stone is very important in classifying it. Certain stones appear splintery, others conchoidal, hackley, uneven, etc.

DIAPHANEITY

The diaphaneity or degree to which a gem transmits light is also important. Gems may be opaque, semi-opaque, sub-translucent, translucent, sub-transparent or transparent.

LUSTRE

The lustre of a gem is noteworthy, varying as it does from that of the Diamond, which is called adamantine, to resinous, vitreous pearly, waxy, etc.

COLOR

The color of the gem is very important, but very misleading as a means of identification as there are several gems that occur in nearly all the different colors. Usually the more rare in color, the more expensive the gem. However, many of the most beautiful colors are most common, and therefore the gems containing them are less expensive. The color of many gems can be changed by different processes. But these stones, though natural in structure, are intended to deceive and cannot be classed as unaltered gems.

HARDNESS

It is well known that different gems have different degrees of hardness. The following is the accepted table for determining this property:

Diamond	10	Apatite	5
Sapphire	9	Fluorspar	4
Topaz	8	Calcite	3
Rock Crystal	7	Rock Salt	2
Feldspar	6	Talc	1

The way to find the hardness of a gem is to find what other stone of known hardness scratches it and is scratched by it. To illustrate: The Diamond will scratch the Sapphire; the Sapphire the Topaz, etc.; and again, a stone that is scratched by the Topaz and not by Rock Crystal may be said to have the hardness of 7, thus a very important element has been discovered, tending to identify the gem. In the alphabetical list of gems, found elsewhere in this book, the hardness is given in each case.

SPECIFIC GRAVITY

The weight of a gem, as compared to an equal bulk of water, is an important verification of any other means of identification, and often alone serves to determine to which variety a gem belongs. The best way to gauge this property is to find in which of several liquids of known specific gravity the gem will barely float. Zircon, or Jargoon, whose specific gravity is 4.7, is the heaviest gem. Garnets, Rubies, Sapphires, Diamonds, etc., down to the Opal, whose specific gravity is 2.21, are all of lesser gravity, in the order named.

LIGHT ACTION

The four ways in which light is affected by precious stones are important means of identifying gems to the scientist. To these properties, the lustre, fire and other attractive qualities of precious stones are entirely due. Dichroism is the property possessed by some colored gems of taking on different shades when viewed from different angles. The other properties of light action can be determined with certain instruments.

HEAT

Extreme heat affects the color of many gems, and great caution is required on the jeweler's part in soldering

jewelry or subjecting the stone to other processes which heat the stone, as some stones, such as sapphires or garnets stand a little heat, while the great majority will not stand any at all.

ELECTRICITY

Many gems possess the quality of becoming electrified by friction. This phenomenon is most apparent in Tourmaline. If warmed, one end of this stone becomes positive, while the other becomes negative.

RADIUM

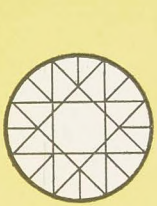
Experiments have been made with Radium on Diamonds changing their color and further developments may be expected.

Styles of Cutting

Stones as they are found are seldom used as gems, without cutting. There are two principal ways of cutting precious stones, besides such special forms as the cameo, intaglio, crest, monogram and scrab, *viz.*:—faceted cutting, and curved surface or cabochon cutting. We illustrate on opposite page the principal forms in which gems are cut. Naturally, transparent or semi-transparent gems are usually cut with facets, which increase their sparkle, while most translucent and opaque gems are cut cabochon, which brings out their color and lustre.

The following list gives the names of the styles of cutting illustrated opposite:—

1. Round brilliant (top view).
2. Oval brilliant (top view).
3. Rose cut (top view).
4. Round brilliant (side view).
5. Cushion brilliant (top view).
6. Rose cut (side view).
7. Step cut (octagon).
8. Rear brilliant (top view).
9. Step cut (oblong).
10. Cabochon (side view).
11. High Cabochon (side view).
12. Lentil shape (side view).



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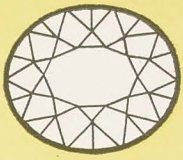

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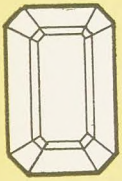

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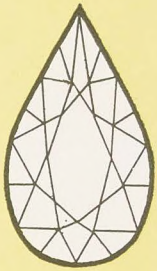

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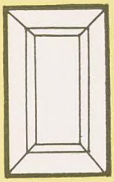

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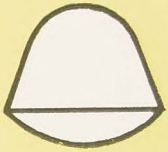

11

12

A Dictionary of Gems

The descriptions given here are designed to give in concise form information that dealers wish to know.

AGATE *Hardness*, 6½

All Agates are varieties of Chalcedony. The name agate is usually applied to that which contains parallels of different colors or spots or patches. There is also an agate which contains some iron oxide in the form of moss or leaves; this is called Moss Agate.

ALEXANDRITE *Hardness*, 8½

Alexandrite is a rare variety of chrysoberyl found in the Ural Mountains and received its name from the fact that it was first found on the birthday of Alexander II, Czar of Russia, in the year 1830. The colors, green by daylight and red by artificial light, are the national colors of Russia.

AMETHYST *Hardness*, 7

A purple variety of transparent Crystal Quartz, shading from a pale violet to a dark plum color. At one time quite scarce, Amethyst was considered one of the most valuable jewels. Queen Charlotte's necklace of fine specimens being valued at two thousand pounds. Cut cabochon or faceted, this stone is very popular.

AQUAMARINE *Hardness*, 7½

As the name implies, this stone has the colors of the sea, varying from pale blue to sea-green. Though not so rare, nor as much in demand as its sister, the Emerald, this stone is of the same chemical composition as the more valuable member of the Beryl family. It is one of the birthstones for March.

BERYL *Hardness*, 7½

A silicate of aluminium and glucinum. This mineral comes in various colors, the green variety known as Emerald, the sea-water blue from which the name Aquamarine is derived. The name Beryl is usually applied to Golden Yellow and colors other than emerald or aquamarine.

CAIRNGORM *Hardness*, 7

A smoky, yellowish brown variety of Crystal Quartz. Its rich dark color makes it very much desired for jewelry.

CARNELIAN *Hardness*, 6½

Derives its name from its color, that of raw flesh. It is a translucent variety of Chalcedony. Its uniform color makes it valuable for intaglios, etc.

CATS EYE *Hardness*, 8½

The other most valuable variety of Chrysoberyl. Cut cabochon possesses a peculiar effect, similar to that in the iris of a Cats Eye. Until Tiger's Eye, a brown variety of Quartz, was widely employed as a substitute, this stone was very popular. It appears in yellow or light green.

CATS EYE (QUARTZ) *Hardness*, 6½ *to* 7

A variety of Quartz somewhat resembling the true Cats Eye in appearance, but much less beautiful. Greenish grey in color.

CHALCEDONY *Hardness*, 6½ *to* 7

To this family belong all the varieties of Agate, Bloodstone, Carnelian, Chrysoprase, Onyx, Jasper, etc. What is usually known as Chalcedony is the pure mineral of transparent gray, often tinged with blue, green, etc.

CHRYSOBERYL *Hardness*, 8½

A beautiful transparent gem-stone, in different shades of brown, yellow, sage-green, etc. Cut faceted, it is very effective in gold jewelry. Cats Eye and Alexandrite are the two most valuable varieties.

CORAL *Hardness*, 5

This well-known stone, which is built up by the outgrown shells of minute inhabitants of the sea, ranges in color from bright pink to dark red. It is cut cabochon, and is widely used.

CROCIDOLITE *Hardness*, 7

A fibrous, lustrous brown and yellow variety of Quartz, which when cut cabochon, presents shimmering lines, somewhat resembling Cats Eye, and usually called Tiger's Eye.

EMERALD *Hardness, 7½ to 8*

The present demand for green stones, and the increasing scarcity of Emeralds, make this stone at the present time the most precious of all gems. The most valuable specimens of this transparent gem have the well-known velvety emerald green color, but lighter shades are also found.

The Emerald is the birthstone for May.

GARNET *Hardness, 6½ to 7½*

The most common color of the Garnet is red, which, when cut cabochon, is known as the Carbuncle. Many other colors are found, however, including violet, brown, delicate pink and green. It is the birthstone for January.

JADE *Hardness, 6½ to 7*

This sage-green and green-and-white stone is particularly valued by the Chinese, who, with infinite patience, fashion rings, bracelets and many other ornaments from this tough mineral. The best Jade comes from Upper Burmah, but the darker green variety is also found in New Zealand. Jade is very popular for jewelry of all kinds, especially seal rings.

MOONSTONE *Hardness, 6*

Is a very beautiful sub-variety of Feldspar, and reflects a bluish-white light in an opalescent manner.

OLIVINE *Hardness, 6½ to 7*

The gem known by the jeweler as Olivine is a demantoid garnet of a beautiful olive green color. It has great dispersive power and is not exceeded by the diamond in this respect.

OPAL *Hardness, 6*

This well-known stone is of a formation somewhat similar to Quartz, but the exact cause for its opalescence is unknown. The Opal was in such high esteem with the Romans that one of them fled the country to save an Opal about the size of a hazel-nut, valued at what would now be one hundred thousand dollars, from being seized. The best Opals come from Australia, Hungary and Mexico. The Opal is unique among stones in the variety of colors, which can be likened only to the plumage of certain birds. In gold settings, Opals are exceedingly popular for both conventional and artistic jewelry. The favorite is the Harlequin Opal, showing bright green and crimson flashes.

For the past few years a black variety has been very popular. It is thus described by the artist Du Ble:

"When Nature had finished painting the flowers, coloring the rainbow and dyeing the plumage of the birds, she swept the colors from her palette and moulded them into Opals."

Opal is one of the birthstones for October.

PEARLS

Pearls are very unlike other gems, in that they are found in the shells of oysters and other shell-fish. The beautiful fresh-water pearls of the United States rival those of the Orient in lustre, and surpass them in color. Round Buttons, Baroques, etc., are always to be had. It is one of the birthstones for June.

PEARLS (Cultured)

Every year during the months of July and August small pieces of rock and stone are placed in spots where the larvae of the pearl-oyster have been found to be most abundant. Soon small oyster-spots are found attached to them. As this takes place in shallow waters of not more than a few fathoms, they would die from cold if left there during the winter, so together with the rocks to which they are anchored, they are removed to deeper waters and carefully laid out in beds prepared for them. Here they lie until they reach their third year, when they are taken out of the sea and undergo an operation which leads to pearl formation. This consists chiefly in introducing into them round pieces of nacre, which are to serve as the nuclei of pearls. These shells are then put back into the sea and left undisturbed for at least four years more. At the end of that time they are taken out, and it is found that the mollusk has invested the inserted nucleus with layers of nacre and has, in fact, produced a pearl.—*From K. Mikimoto's Booklet on Japanese Cultured Pearls.*

PERIDOT *Hardness, 6 to 7*

A clear yellow green gem; variety of the mineral chrysolite. It is very effective and may be had in a number of sizes and shapes. It is a moderate-priced stone, and is one of the birthstones for August.

QUARTZ *Hardness, 7*

To this family belong Rock Crystal, Rutile Quartz, Amethyst, Rose Quartz, Yellow Quartz (called Spanish Topaz), Smoky Quartz, called Cairngorm, Milky Quartz, Aventurine, etc. It is common mineral, usually transparent and hard enough to be cut as a gem stone. Some of the above sub-varieties are very beautiful in color and widely worn.

RUBELLITE *Hardness, 7*

Red Tourmaline.

RUBY *Hardness, 9*

This red variety of Corundum, to which family the Sapphire and Oriental Topaz also belong surpasses the Diamond in value and is next in hardness. This rare red gem has been highly prized for thousands of years. The finest Rubies come from Burma and Ceylon. The most valuable color is the well-known pigeon's blood. This transparent gem is sometimes cut cabochon.

SAPPHIRE *Hardness, 9*

The name Sapphire is always applied to blue corundum; like the Ruby, which is red corundum, it is cut both faceted and cabochon. The most prized colors for the Sapphires are cornflower and royal blue. The translucent variety of Sapphire or Ruby, when examined in a certain light, shows a six-pointed star; these are cut cabochon and known as Star Sapphires or Star Rubies. Corundum is also found in many other colors. Golden yellow, known as Yellow Sapphire or Oriental Topaz, and purple, known as the Oriental Amethyst. Ceylon, Burma and Siam are the sources of supply for most of these corundum gems.

It is the birthstone for September.

SPINEL *Hardness, 8*

This beautiful transparent gem is hardly appreciated. It is found in many colors, but the well-known flame red variety is the best known. Spinel is closely allied to corundum and sometimes mistaken for Ruby.

SPODUMENE *Hardness, 7 to 7½*

A clear transparent canary-colored stone; resembles Oriental Topaz. Its disposition to cleave or split makes it difficult to cut. A pink variety is called Kunzite.

TOPAZ

There are several kinds of Topaz. The true or precious Topaz is a bright transparent stone found in different shades of yellow and light pink; hardness, 8. Besides these are the Oriental Topaz; hardness 9 (this being yellow corundum and belonging to the Sapphire group). Yellow Quartz is also called Topaz, the dark or brown variety of which is called Spanish Topaz; hardness, 7. Topaz is the birthstone for November.

TOURMALINE *Hardness, 7 to 7½*

This transparent stone is found in almost any color, red and green predominating. Different colors are sometimes found in the same crystal. Dark-red Tourmaline is called Rubellite and is cut faceted and cabochon. It is one of the birthstones for October.

ZIRCON *Hardness, 7½*

In certain properties, this gem is unique. Next to the Diamond, it is the most brilliant and has the adamantine lustre. It is the heaviest of gems and is found in a variety of colors, brown predominating. The white stones, called Jargoons, are sometimes mistaken for diamonds and the small Rose cut stones are the so-called Matara diamonds.

Some very fine specimens of Blue and Green have recently come into the market which quite outrival the Aquamarine in color, lustre and price.

Symbolism in Gems and Jewelry

The individualizing of gifts of gems or jewels is one of the refinements of the art of the modern jewelry craftsman. The goldsmiths of Cellini's day made generous use of symbolism, embodying in the metals they wrought and in the gems they used a suggestion of the personality of patron or possessor or both.

Appropriate symbolism enhances the value of the choicest piece of jewelry. It may reflect a hope, an aspiration, an affection or an experience; its secret hid from all save the recipient and the giver.

Jewelry thus made has a value to the possessor far beyond the intrinsic value of the gems and metals used or the skill of the workmanship employed.

The jeweler, in designing a piece of symbolic jewelry, usually takes into consideration first the birthstone of the person for whom the ring, brooch, scarfpin, etc., is intended as well as the donor of the gift. Sometimes but one birthstone is used, but often both.

Very often the appropriate Zodiacal Signs are included in the design and often, too, the conventionalized flower of the proper month or months.

To include in the design an intimate experience significant only to the donor of the gift and to its ultimate possessor requires that the jeweler be made somewhat of a confidant in the execution of the work.

We are giving herewith, as a help to the designer of Symbolic jewelry, "The Sentiment of the Months," including Natal Stones, Talismanic Gems, Guardian Angel, Special Apostles, Zodiacal Signs and Flowers.

JANUARY

Natal Stone	Garnet.
Talismanic Gem	Onyx.
Guardian Angel	Gabriel.
Special Apostle	Simon Peter.
Zodiacal Sign	Aquarius.
Flower	Snowdrop.

The gleaming garnet holds within its sway
Faith, constancy and truth to one alway.

FEBRUARY

Natal Stone	Amethyst.
Talismanic Gem	Jasper.
Guardian Angel	Berchiel.
Special Apostle	Andrew.
Zodiacal Sign	Pisces.
Flower	Primrose.

Let her an amethyst but cherish well,
And strife and care can never with her dwell.

MARCH

Natal Stones	Aquamarine. Bloodstone.
Talismanic Gem	Ruby.
Guardian Angel	Malchediel.
Special Apostle	James and John.
Zodiacal Sign	Aries.
Flower	Ipomea, Violet.

Who wears a bloodstone, be life short or long,
Will meet all dangers, brave and wise and strong.

APRIL

Natal Stone	Diamond.
Talismanic Gem	Topaz.
Guardian Angel	Ashmodei.
Special Apostle	Philip.
Zodiacal Sign	Taurus.
Flower	Daisy.

Innocence, repentance—sun and shower—
The diamond or the sapphire is her dower.

MAY

Natal Stone	Emerald.
Talismanic Gem	Carbuncle.
Guardian Angel	Amriel.
Special Apostle	Bartholomew.
Zodiacal Sign	Gemini.
Flower	Hawthorn.

No happier wife and mother in the land
Than she with emerald shining on her hand.

JUNE

Natal Stones	Pearl or Moonstone.
Talismanic Gem	Emerald.
Guardian Angel	Muriel.
Special Apostle	Thomas.
Zodiacal Sign	Cancer.
Flower	Honeysuckle.

Thro' the pearl's charm, the happy years
Ne'er see June's golden sunshine turn to tears.

JULY

Natal Stone	Ruby.
Talismanic Gem	Beryl.
Guardian Angel	Humiel.
Special Apostle	Paul.
Zodiacal Sign	Leo.
Flower	Holly.

July gives her fortune, love and fame,
If amulet of rubies bear her name.

AUGUST

Natal Stones	Sardonyx. Peridot.
Talismanic Gem	Diamond.
Guardian Angel	Hamatiel.
Special Apostle	James, the son of Alpheus.
Zodiacal Sign	Virgo.
Flower	Poppy.

She, loving once and always, wears, if wise,
Sardonyx—and her home is paradise.

SEPTEMBER

Natal Stone	Sapphire.
Talismanic Gem	Jacinth.
Guardian Angel	Tsuriel.
Special Apostle	Lebbeus Thaddeus.
Zodiacal Sign	Libra.
Flower	Morning-glory.

If sapphire upon her brow is laid
Follies and dark delusions flee afraid.

OCTOBER

Natal Stones	Opal. Tourmaline.
Talismanic Gem	Agate.
Guardian Angel	Bariel.
Special Apostle	Simon (Zelotes).
Zodiacal Sign	Scorpio.
Flower	Hops.

When fair October to her brings the opal
No longer need she fear misfortune's peril.

NOVEMBER

Natal Stone	Topaz.
Talismanic Gem	Amethyst.
Guardian Angel	Adnachiel.
Special Apostle	Matthias.
Zodiacal Sign	Sagittarius.
Flower	Chrysanthemum.

Firm friendship is November's, and she bears
True love beneath the topaz that she wears.

DECEMBER

Natal Stones	Lapis Lazuli. Turquoise.
Talismanic Gem	Sapphire.
Guardian Angel	Verchiel.
Special Apostle	Matthew.
Zodiacal Sign	Capricornus.
Flower	Water-lily.

No other gem than turquoise on her breast
Can to the loving, doubting heart bring rest.

SECOND EDITION
Produced by
GEM CREATIONS PUB. CO.
36 West 47th Street
New York