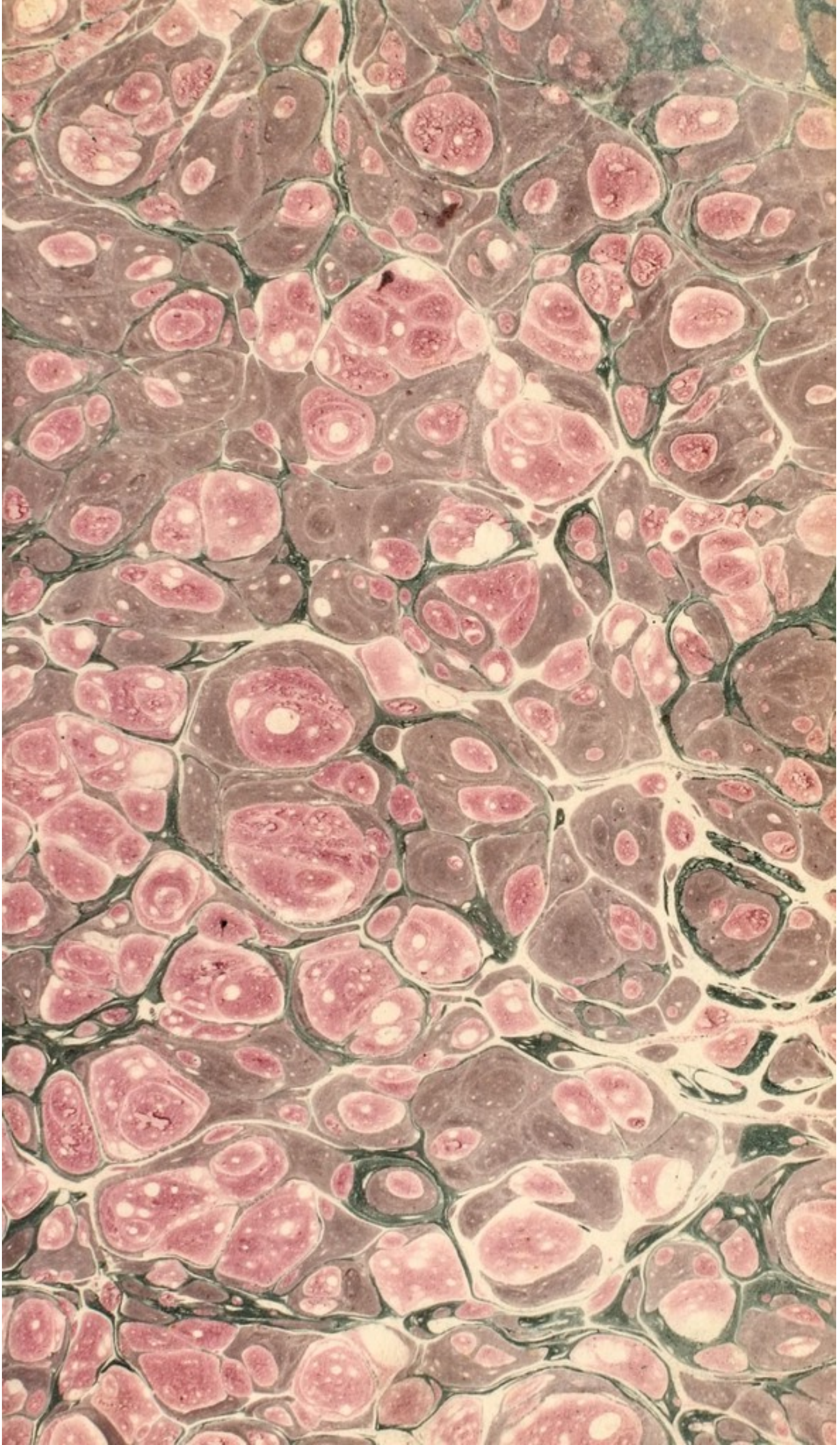
A treatise on diamonds, and precious stones, including their history. Natural and commercial / To which is added, the methods of cutting & polishing. With colored plates. By John Mawe.

Le Comte D. Boutourlin



Sh Roy. Branet

J. Mawe a composé deux autres ouvrages:

Travels in interior of Brazil &c. London 1812 in 4°.

The Linnæan System of conchology[a] &c. Lond. 1823. in 8°.

(a) Sic, p. conchyliology?

A

TREATISE ON DIAMONDS,

&c. &c. &c.

W. M'Dowall, Printer, Pemberton Row, Gough Square.

FRONTISPIECE.

Colored Stones.

J. Mawe, 149, Strand.

A

TREATISE ON DIAMONDS,

AND

Precious Stones:

INCLUDING THEIR

HISTORY—NATURAL and COMMERCIAL.

To which is added,

THE METHODS OF CUTTING & POLISHING.

WITH

COLORED PLATES.

BY JOHN MAWE,

Honorary Member of the Mineralogical Society of Jena, &c. &c.
Author of Travels through the Gold and Diamond District of Brazil; Lessons on Mineralogy and Geology, New Descriptive Catalogue, &c.

Here the soft emerald smiles, of verdant hue,
And rubies flame, with sapphire's heavenly blue;
The diamond then attracts the wondrous sight,
Proud of its thousand dies, and luxury of light,

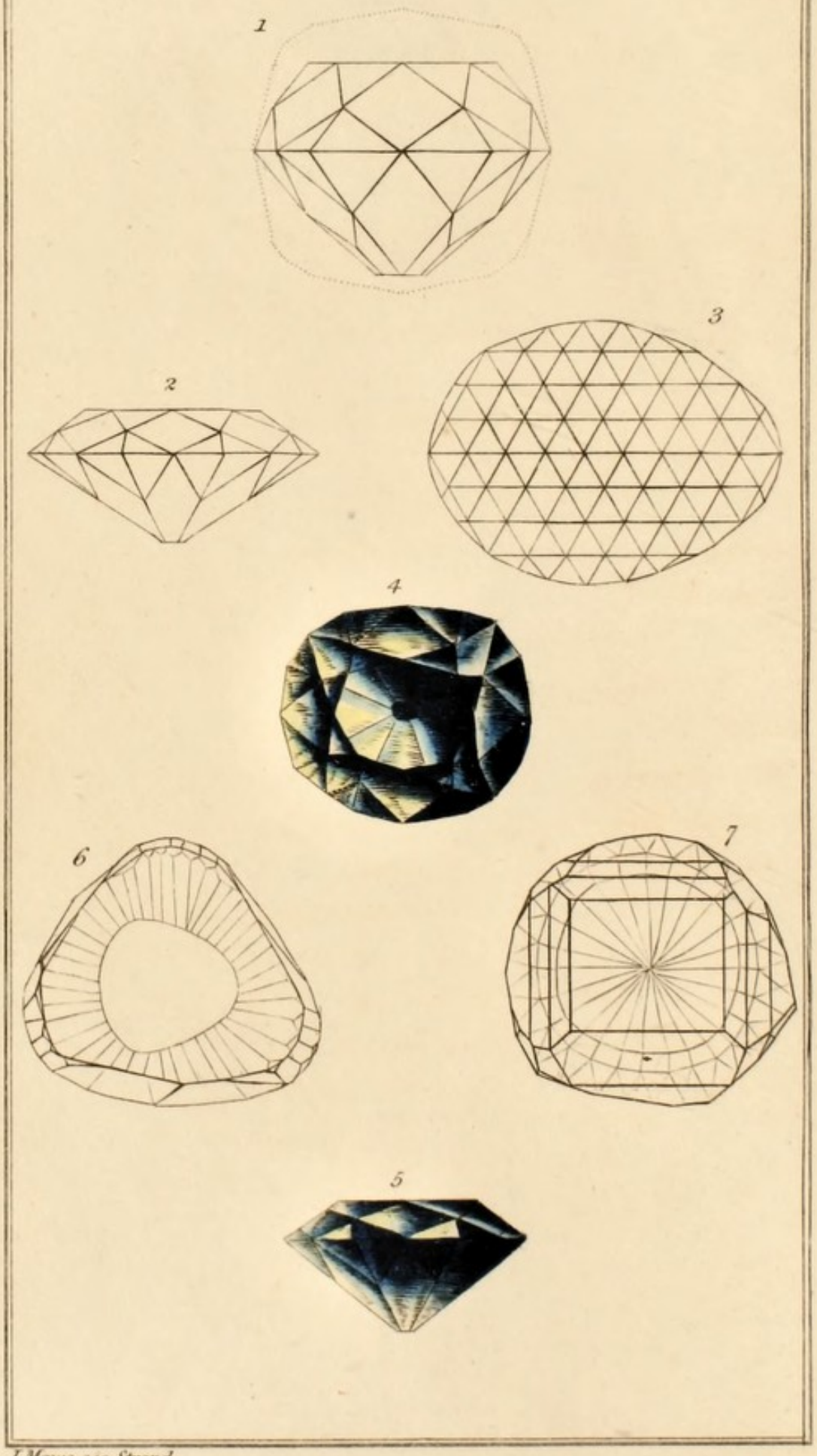
SECOND EDITION.

London:

PRINTED FOR AND SOLD BY THE AUTHOR, 149, STRAND; AND LONGMAN, HURST, REES, ORME, AND BROWN, PATERNOSTER ROW.

1823.

Peculiar Diamonds.



J. Mawe, 149 Strand.

EXPLANATION OF THE PLATES.

FRONTISPIECE.

COLORED STONES.

1 Sapphire.
2 Oriental Ruby.
3 ..... Amethyst.
4 ..... Topaz.
5 Asteria.
6 Chrysoberyl.
7 Spinelle Ruby.
8 Emerald.
9 Topaz.
10 Aquamarine.
11 Amethyst.
12 A Doublet.
13 Turquois.
14 Chrysoprase.
15 Garnet.
16 Sardoine.
17 Onyx.
18 Oriental Agate.

PECULIAR DIAMONDS.

1 Regent Diamond.
2 Pigot ditto.
3 Austrian ditto.
4 Blue ditto.
5 Profile of ditto.
6 Nassuc ditto.
7 Grand Russian ditto.

PLATE I.

No. 1. Represents a regular octahedral diamond.

2. The top and bottom reduced to form the table and collet.

3. The preceding, single cut.

4. Profile of a full sized brilliant.

a The Table.

b Collet.

c Girdle.

d Bizel.

e Collet side.

5. Table and bizel of No. 4.

6. Collet and collet side of the same.

7. Two views of a rose diamond.

a An oval diamond.

8. Table and bizel.

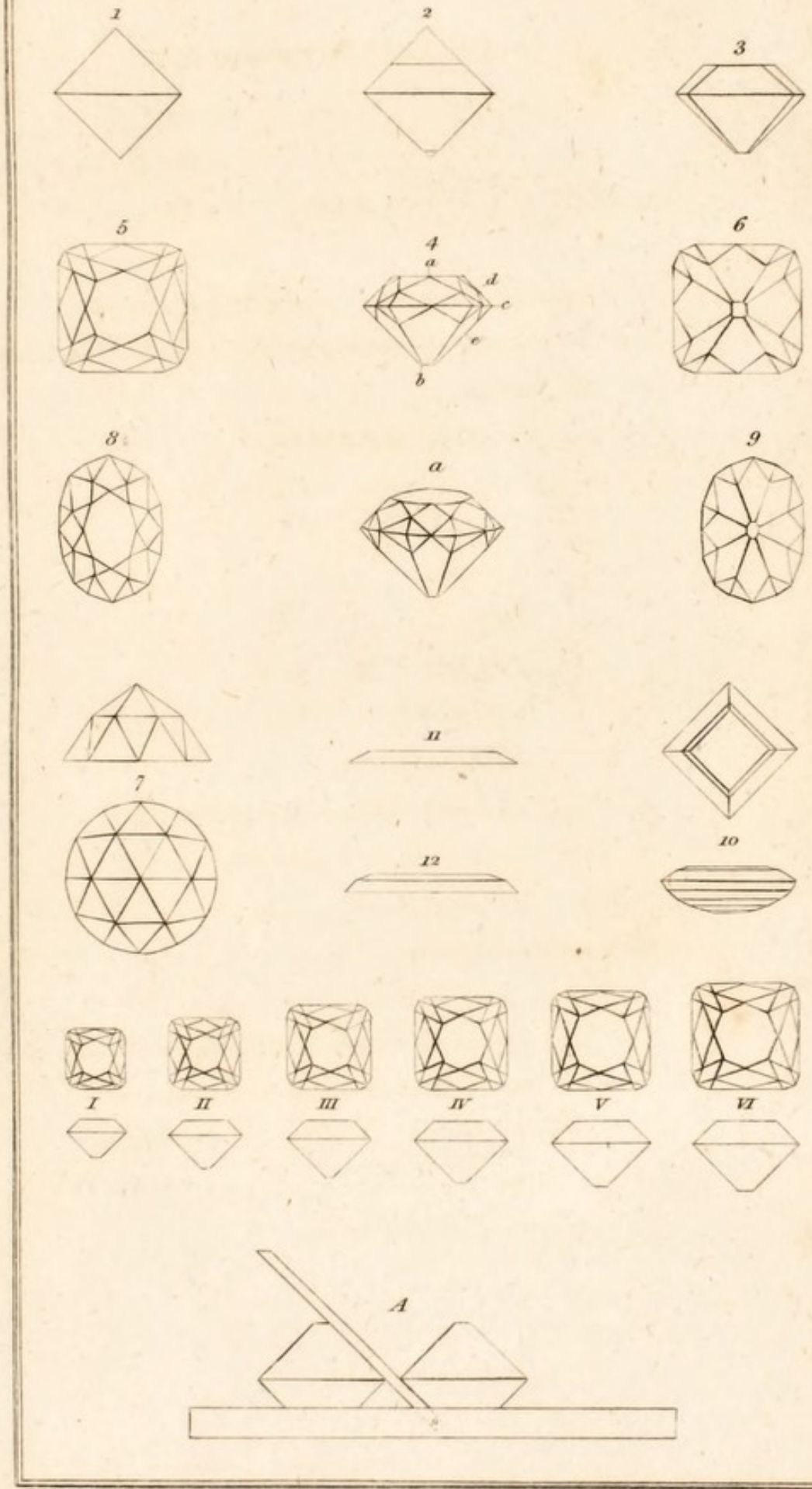
9. Collet and collet side.

*** The last three figures represent the size of a well proportioned ten-carat diamond.

10. Table diamond.

11. A Lasque.

12. The same with one bevel.



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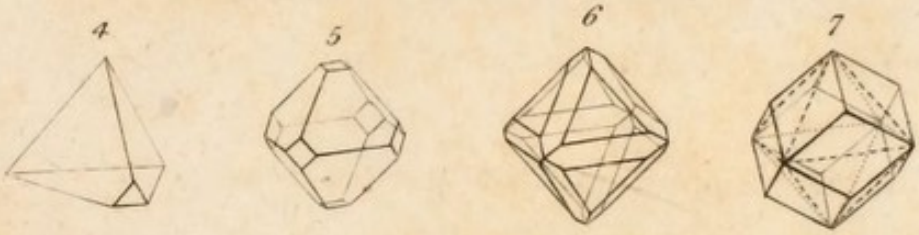

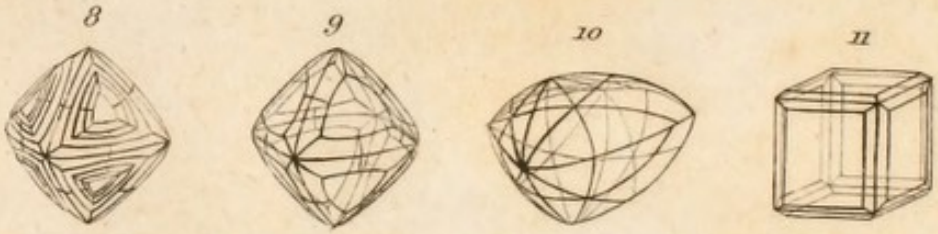

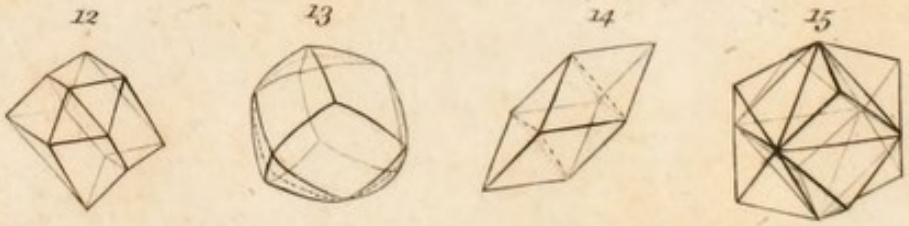

J. Mawe, 149, Strand.

Nos. I. to VI. represent the sizes of brilliants of from one to six carats, cut in exact proportion.

A. An instrument called by diamond cutters "The Compass." It is formed of a piece of plain brass for the base, with a moveable arm in the centre, which in the fig. is set at 45 deg. measuring the inclination of the collet side to the girdle; and of the bizel to the table, at the supplement of the same angle. See p. 73.

PLATE II.

FIGURES OF ROUGH DIAMONDS.

No. 1. The dotted line shews the direction in which it will split.

2. The octahedron split in half.

3. Shews No. 2. split, forming a quadrant or sharp.

4. The octahedron passing into the tetrahedron.

5. Cubic octahedron, or the octahedron passing into the cube.

6. Octahedron truncated on the edges.

7. Dodecahedron complete.

No. 8. Octahedron with laminæ of superposition on each face, passing into spheroidal.

9. The same form with smooth faces.

10. The spheroidal elongated.

11 The cube with beveled planes on the edges.

12. Octahedron macled, or hemitrope.

13. Rounded dodecahedron.

14. Acute Rhomb.

15. Twenty-four sided crystal, formed by a three-sided pyramid on the planes of the octahedron.

a Represents a rough piece of amorphous diamond.

b Cascalho, silicious pebbles aggregated, and enveloping diamond.

c Large diamond confusedly crystallized.

DIAMOND CUTTER.

a The box to receive the powder produced by cutting.

b The stick to which diamonds are cemented.

c A tube to receive the stick, or dopp, whilst the cement cools.

DIAMOND CUTTER.

DIAMOND POLISHER.

d Charcoal fire, used to soften or melt the cement.

e Tongs.

DIAMOND POLISHER.

No. 1. The tongs holding the dopp and diamond.

2. The dopp.

3. The skive, or horizontal mill.

4. A Diamond being polished on the mill.

5. Lead weights on the tongs, to increase pressure.

6. Steel mortar for reducing diamonds to powder.

7. Glasses containing olive oil and diamond powder.

8. and 9. Iron pins, against which the tongs press when the skive is in motion.

10. The strap and spindle.

11. The frame.

CONTENTS.

ERRATA.

Page 29, line 14, for *heliotrope* read *hemitrope.*
Page 68, in the note, for *p.* 77, read *p.* 78.
Page 113, line 6, for *it* read *its.*

INTRODUCTION.

THERE are few things in history that at first sight appears so remarkable as the prodigious value, which, by common consent, in all ages, and in all civilized countries, has been attached to the Diamond.

Among ornaments and luxuries it has ever occupied the highest rank. Even Fashion, proverbially capricious as she

is, has remained steady in this, one of her earliest attachments, during probably three or four thousand years.

The fascinating beauty of this gem, depending on its unrivalled brilliancy, was unquestionably the original cause of its attracting admiration, and which still upholds it in universal estimation: notwithstanding the smallness of its size, there is no substance, natural or artificial, that can sustain any comparison with it in this respect. The vivid and various refractions of the opal, the refreshing tint of the emerald, the singular and beautiful light that streams

from the Asteria, the rich colors combined with high lustre that distinguish the ruby, the sapphire, and the topaz, beautiful as they appear upon near inspection, are almost entirely lost to the distant beholder; while the Diamond, on the contrary, whether blazing on the crown of state, or diffusing its starry radiance from the breast of titled merit, or wreathing itself with the hair, and entering ambitiously into contest with the living lustre of those eyes that "rain influence" on all beholders, proclaims to the most distant of the surrounding crowd, the person of the monarch, the noble, or the beauty.

The gem, without any essential color of its own, imbibes the strong solar ray, and reflects it with additional intensity, hardly yielding to the splendor of the meridian sun.

Another circumstance tending to enhance the value of the Diamond is, that although small stones are sufficiently abundant to be within the reach of a moderate expenditure, (and therefore affording to all persons who are in easy circumstances, an opportunity of acquiring a taste for Diamonds), yet those of larger size are, and ever have been, rare; and of the most celebrated for

magnitude and beauty, the whole num-
number in Europe scarcely amounts to half a dozen, all of which are in the possession of sovereign Princes. Hence the acquisition of a moderately large Diamond, is what mere money cannot always command; and many are the favors, both political and personal, that have been offered in exchange for a Diamond of uncommon beauty, where its commercial price in hard cash, neither could be tendered nor would be received.

It may also be remarked that this species of property has hitherto been but

little liable to fluctuation, and has continued for several years gradually to increase in value; insomuch that the price of stones of good quality, if estimated by the rules in practice sixty years ago, would now, even in the depressed state of the market, be considerably too little*.

The properties and characters of the Diamond have occupied the attention of chemists, crystallographers, and mineralogists, from the time of Pliny to the present day: the most intelligent of our

* The commerce of Diamonds may hereafter be much affected by the recent political changes in Brazil; as Europe depends almost entirely on that country for its supply.

travellers, into those parts of the world where Diamonds are procured, have also furnished several interesting particulars. It has been the aim of the author in this treatise to condense their remarks, and to present the reader with a succinct account of the history and nature of the Diamond. Much of the original information contained in the following pages, is the result of the author's travels in Brazil, and of an extensive dealing subsequently in this valuable commodity, which has enabled him to supply a very detailed account of its present commercial value. In this part of the work he may perhaps be accused of egotism, but

when it is considered that the circumstances he relates occurred under his own observation, he trusts that he may be pardoned for having so often spoken in the first person.

TREATISE ON DIAMONDS,

&c. &c.

CHAPTER I.

SECTION 1.—*Preliminary Observations.*

BEFORE I begin to treat on the peculiar characters of Diamonds, it may be proper to enumerate the different shapes and forms in which they appear when polished. The first of these is termed the *Brilliant*, the next the *Rose*, the third the *Table*, to which may be added the *Lasques*. All these distinctions will be found fully explained in the section on cutting and polishing.

It may also be premised, that, in speaking of individual diamonds, we often, for the sake of convenience, use the term stone, "a beau-" tiful stone," "a bad stone," which, although not strictly applicable to this substance, is sanctioned by general usage.

Diamonds are sold by a particular standard, which appears to be universally adopted. The integer of weight is termed a *carat*, and it is divided into four grains. To prevent the circumlocution arising from the use of two terms, the weight of a diamond is often stated simply in grains. The carat is divided not only into quarters, (or grains), but also into eighths, sixteenths, thirty-seconds, and sixty-fourths, and these minute subdivisions

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* The carat is an Indian denomination of weight. One hundred and fifty carats and a quarter are equal to an ounce, Troy.

are ascertained by scales of the greatest nicety and exactness. A stone weighing two carats would be said to weigh eight grains, and one of four carats and a grain would be more briefly designated by the lower denomination, as weighing seventeen grains.

THE commerce of diamonds is, perhaps necessarily, in the hands of two distinct classes: viz. the diamond merchants and the jewellers. The former are considered to be men of opulence, well acquainted with the nature and properties of the gems in which they deal, and with the mechanical details of the manufacturing department. As their dealings are almost exclusively in large amounts, they may be said to be little known, except to the importers of rough diamonds, and to *the trade*, as distinguished from the public in general. The diamonds being manufactured, cut, and polished; or, to use the technical term, *made*, are ready for the jeweller, who selects such

as may best suit his purpose; these being weighed, are sold to him at such prices, and on such terms of payment, as may be agreed upon. He then commences the operations belonging to his department or art; which is to arrange, display, and set the gems so as to produce the best effect, and present the most striking and captivating appearance, according to the nature of the ornament required: whether it be an elegant groupe, richly combined, a necklace, an ear-drop, a ring, or a pin. The setting should be as little shewn as possible, for it is by concealing his art that the jeweller displays the gem to the greatest advantage.

Having shewn the source from whence the trade is supplied with diamonds, it may not be improper to notice the state in which they are generally offered for sale to the public, and give some idea of the manner in which jewellers dispose of them.

DIAMONDS, when well set, always appear larger than when they are loose, and this circumstance gives great advantage to the seller. Shallow brilliants, that have a great surface, are for this reason always in request, and are generally set *close.** Thus a stone of only a carat may appear as large as a well-proportioned stone of six grains.

THE smallest flaw, or *foul*, (as it is called) greatly diminishes the price of the diamond; and if it be tinged with yellow, brown, &c. a fault characterized by the technical term *off color*, its value falls very considerably, and is frequently reduced from a third to one half. To counteract these defects, and to conceal the appearance of what are deemed imperfec-

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* A brilliant is said to be *close set*, if the setting has a back; it is said to be open, *au jour*, if it has no back. Fine brilliants are always set open.

tions, great ingenuity is exercised, and often with success, so that an inferior stone obtains the price of a perfect brilliant. It rarely happens that the purchaser of a suite of jewels is acquainted with the circumstances incident to diamonds, and from this inexperience and want of sound judgment on the qualities of the article, he is obliged to rely implicitly on the good faith of the person with whom he deals.

It may here be observed, that from the great value attached to diamonds, and from the universal desire of the opulent to possess them, various compositions have been manufactured in imitation of them. As these imitations, however, are unable to sustain a rivalry with the pure brilliant, manufacturers have succeeded better in endeavouring to form, with all the advantage of close setting, an imitation resembling bad, discolored, faulty diamonds, more especially rose diamonds;

but let the composition be drawn from its glittering cell, and it will fade into insignificance before the real gem, which, with its vivid flash, will so forcibly appeal to the eye, that even an inexperienced observer must feel ashamed of having been for an instant deceived.

WHITE topazes, and rock crystal, have been exposed for sale as diamonds, and glass has also been made into peculiar forms, to resemble the rough gem. These deceptions have often been practised abroad, and sometimes with success.

PERSONS accustomed to inspect diamonds, judge of them, when close set, from the perfection of the facets and the sharpness of the work. Yet, though an experienced judge may, in this case, pronounce with tolerable certainty on the nature of any specimen shewn him, I consider it best to withhold an opinion

of any stone when close set, and not to decide until it is taken out, as the most practised eye may possibly be deceived by the various artifices of placing foil, patching that foil coloring, &c.* The most simple and best method of determining whether a substance is diamond or paste, is to apply a very fine file to the girdle, which produces no effect upon the diamond, while paste or composition are easily abraded by it; and if the girdle or projecting angle of a *diamond* be applied to stones which deface the file, as white topaz, sapphire, &c. it will instantly cut them, the diamond having no rival that approximates to it in hardness. But it is by no means advisable to apply this test with a valuable diamond, as it might possibly produce a flaw.

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* Glass or stones, set with foil, reflect its color; those which are intended to imitate diamonds, when looked at attentively, always appear too white.

Other means of distinguishing diamonds from inferior substances, though highly useful, such as the polarisation of light, electricity, specific gravity, combustion, &c. can rarely be resorted to, except in the laboratory of the philosopher, and are little available to the purchaser of diamonds. The safest and most efficacious criterion for detecting flaws in brilliants, or, in a word, faulty diamonds, is *tact*, resulting from vigilant attention and habit.

SECT. II.

Commercial Value of Diamonds.

In the great or wholesale trade there is but little fluctuation in the price of those diamonds which may be termed *stones in general demand.* I will begin with brilliants, from a

grain, to two and a half grains each. Such brilliants, double cut, and what may be termed fine, are worth from seven to eight pounds, per carat. Needy sellers may take ten per cent. less for cash; but this is the general average price for a lot of ten, twenty, or fifty carats of well-made stones, if the quality be good.

Brilliants, from two grains to three, may be bought in lots, at from seven guineas to eight pounds, per carat. It is to be understood, that diamonds in a lot are never all quite free from faults, hence there may arise a difference of ten per cent. in the price. Stones of three grains, if fine and perfect, are always in demand, at eight or nine pounds per carat.

Brilliants, from three grains to four, if very fine, and well proportioned, are worth from eight guineas to nine pounds, per carat.

Those of a carat each, if very fine, and well selected, are now worth nine guineas to ten pounds. Three years ago, I offered twelve pounds each for eight, and could not obtain them.

BRILLIANTS, from five grains to six, if pure, are worth from thirteen to fourteen pounds; if perfectly fine, and of the full weight of six grains, they are worth seventeen to eighteen pounds each; I have, for such, paid twenty pounds.

BRILLIANTS of two carats each, are worth from twenty-seven to thirty pounds. Stones of this weight, if well proportioned, are considered of a fine size, and well calculated for pins, or the centre of clustres. Indeed, well proportioned diamonds from six grains to two carats each, are always in demand, and are retailed at from twenty to thirty-five pounds, each, according to their degree of per-

fection, or as the retailer may think fit to charge them.

For brilliants of three carats, if fine and well formed, from seventy to eighty pounds may be obtained. Stones of this size and larger are more liable to capricious fluctuations of price than the smaller ones before named, being chiefly required for the centre stones of saleable necklaces.

Brilliants of four carats, if fine, are worth from £100 to £130. I have sold stones, single cut, a little *off color*, of this weight at eighty guineas. I possessed one of seventeen grains, perfectly white, having a surface as large as that of a seven carat stone ought to be, it was consequently very thin, but being much in request on account of its great *spread* or surface, it was sold for £160.

Brilliants of five carats are not frequently

met with in general trade, and are variable in price, as the dealers exact more if they know that such stones are wanted, than they would in the regular course of business. The prices may be said to vary from £180 to £200.

Brilliants of six carats, as before-stated, are not common; they are suitable for centre stones of expensive necklaces, and single stone rings: if perfect and well-shaped, they sell for £230 to £250, or more.

For estimating the value of peculiarly fine diamonds, there is no fixed standard; the rule already published may, however, serve as a sort of guide.

Rough Diamonds, selected as fine, and well formed for cutting, may be estimated as follows: — Square the weight of the stone, multiply the product by two, and the result will be the value in pounds ster-

ling. This rule, however, is by no means in general use. Brilliants, if fine, may be estimated by squaring the weight in carats, and multiplying the product by eight, which will give the amount in pounds sterling.*

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* This is an Indian rule, and is only applicable in some cases: but if there should be any natural imperfection in the stone or brilliant, or even if it be ill formed although pure, the multiplier must be taken at a much lower number; and if *superlatively fine*, it may be taken, in some peculiar cases, proportionably higher.

SECT. III.

Remarks on the Purchase and Sale of Diamonds.

THE following observations may be found useful to those who are desirous of purchasing or disposing of diamonds.

I ONCE possessed a brilliant of eight carats, well proportioned, and extremely fine, with the exception of two spots of what is technically called *foul;* one was in the centre of the table, not larger than a small pin's head, and the other at the corner of the table. It was sold for £380; but had it been quite perfect, it would have obtained from £550 to £600, or more.

THE *Nassuc* diamond, valued at thirty thousand pounds, and which I modelled on

its arrival in England, belonging to the East India Company, weighs seventy-nine and a half carats, and if it were a well-proportioned stone, and cut in brilliant, it would doubtless be much more valuable. This example may serve to shew, that it is not merely because the substance is a diamond that it commands a high price; but because, as a diamond, it must have all the qualities that art can bestow, and be faultless.

THERE is an extensive traffic in these precious substances, exclusive of the regular trade between the jeweller and the merchant. A person possessing a suit of brilliants may be inclined to part with them from necessity, or other causes. This occurs so frequently, that diamonds to a great amount are continually disposed of in a private way. If, as it frequently happens, necessity be the motive, a degree of caution and delicacy is to be observed, which renders any competition of pur-

chasers impossible, and prevents the article from obtaining its true value. In this sort of confidential bargain, it is to be lamented that the seller is almost compelled to accept such terms as may be offered.

SOME time ago, a person was obliged, or perhaps persuaded to dispose of a brilliant necklace that had been received as a gift. The lady applied to ——, in whom she had implicit confidence. The result of the interview was, that they purchased the article for a sum under £300. Being themselves in want of money, they took the stones from the setting, and sold them by weight for nearly double the purchase-money.

ANOTHER instance is within our knowledge of a lady having purchased a pair of ear-ornaments (tops and drops) for £250; after a lapse of some time she determined to sell them, and was only offered £60! She afterwards

went to a Diamond Merchant, who weighed the drops, and offered £120 for them alone, which was accepted.

A LADY became possessed of a brilliant necklace by legacy, on which it was necessary to pay the duty. A jeweller was referred to, who valued them at £1,600,* and the duty was paid on that sum. The same necklace was soon afterwards disposed of, and estimated only at £800, in *exchange* for other articles!

It may here be observed, that the great difficulty which presents itself to those who may be delicately situated, and wish to dispose of their Diamonds, arises from their not knowing

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* By a general rule in the trade, one per cent. is demanded for giving an estimate on the value of diamonds.

that they are sold by weight. Diamonds free from flaws have generally a regular price: they are easily taken out of the setting, and a working jeweller would do it in a few minutes; but if the brilliants are very thin it is the safest way to put them, for a few hours, in nitric acid, when they become loose by the acid dissolving a portion of the silver cramps that confine them.

SNUFF-BOXES and portraits set with brilliants are generally composed of thin Diamonds, which present a large surface.

THE fineness, as well as the weight of Diamonds, as before stated, must be considered in estimating their value. Suppose a half hoop ring to be composed of five stones, allow the centre one to weigh three grains; those next to it 2½ grains each, and the others, 2 grains each: here would be three carats of Diamonds, which, if fine, would cost the retailer from £18

to £20, but if they were in any degree inferior, would not cost more than from £14 to £16.

To judge of Diamonds accurately, they should be laid loose in a good light, upon a sheet of white paper, on which their purity and brilliancy are best seen, their proportions ascertained, and the tinges of color, specks, flaws, foul, &c. most visibly exposed. This is the proper and fair mode of exhibiting them for sale.

Peculiar shaped brilliants, calculated for ear-drops, sell at *capricious prices* and are always in demand. It may be remarked that a dealer going among the merchants to purchase stones of peculiar forms, and of a certain weight, will have to pay in many cases ten per cent. more than if he bought them in the usual course of dealing.

Two brilliants, single cut but finely propor-

tioned, came into my possession a few years ago, one of which was 17½ grains, the other 18¼ grains: they had the smallest possible tinge of yellow, and were therefore what is termed off color; one sold for £117, the other for £125.

A LOT of brilliants, single cut, from one to two grains each, was consigned to me for sale. At the time I could not obtain more than five guineas and a half per carat. They were worth more, as rough Diamonds could not be bought and manufactured for sale at the same price. They were in a small degree off color, but would set to great advantage in jewellery.

A NECKLACE was sent to me from Spain, for which I allowed £120: the diamonds had a large surface, and black spots appeared through the table to represent the collets. I was aware that they were very thin, and of the description called *lasques*. Taking the stones

from their setting, I found that they were upon foil; many of them brown, and so thin, that the best were only fit for making rose-shaped stones: the others I sold as *bort*, and found it difficult to obtain their cost.

An apparently beautiful brilliant, of a pink color, was sent to me, which I estimated at three carats. A great price was asked, and would have been given; but on drawing the gem it proved to be lightly tinged with color, and set on pink foil.

A rough diamond of 15½ carats, apparently very fine, was consigned to me, valued at £400, it was judged it would be off color. I sold it to a Dutch merchant for £280; its form was a very regular octahedron.

It often occurs that a large rough diamond, of a brown appearance, is only bad in a parti-

cular part—but from the high refractive quality of the gem, it appears discolored all over.

A LOT of eighteen most beautiful rich diamonds, all of very high lustre, was sent to me. They had a slight tinge of yellow, and weighed seventeen carats. The price asked was three pounds per carat; they were afterwards bought at forty-nine shillings, not one of them made a white brilliant; they were all off color, and it was doubtful whether they would be sold at a price to cover the cost.

THREE rough stones were consigned to me; they weighed almost exactly 5 carats each, together 15¼ carats, they were all fine, and would cut free from flaws; though one exhibited some indication of not being of the purest water. Their forms were favorable for cutting to advantage, and making spread stones; they sold for £120, which was considered an excellent price: they would weigh together, when made into brilliants, from 32 to 34 grains.

I RECEIVED a large fragment of diamond, weighing above 12 carats: one end was foul and full of flaws; I split it off, and discovered the foul was owing to a triangular hole, the sides of which were covered with black earth.

YELLOW brilliants, if fine, are generally extremely lively, and suit the purposes of the jeweller in composing fancy articles. When of from one to two grains, they are usually from four to five pounds per carat; being inferior in value to the pure gem. I have known a yellow brilliant of 7¼ carats, to sell publicly for £240.

BRILLIANTS tinged dull green or brown are much depreciated by such colors. Cloudy diamonds are also of little value; but those of fine colors—pink, red, blue, or green, are eagerly sought for by connoisseurs.

DIAMONDS at this time are considered very low, there are many offered for sale but few

buyers; consequently some lots of brilliants, in the hands of needy sellers, may be bought at ten per cent. below the present average price; observing, generally, that diamonds were considerably higher a few years ago.

Brown diamonds are often brought from India of considerable size and brilliancy, but they rarely sell for their cost: indeed, cloudy and bad brilliants, or roses, have scarcely any commercial value, although, however, they may often be highly estimated by the possessor.

Inferior brilliants may be bought very low; I have now a lot before me, in which are some of two grains, for which I would not give four guineas per carat, and roses of the same denomination may be bought at forty or fifty shillings.

Bad discolord diamonds are sold to break into powder, and may be said to have a more

extensive sale than brilliants with all their captivating beauty. In many operations of art they are indispensible; the fine Cameo and Intaglio owe their perfection to the diamond, with which alone they can be engraved. The beauty of the Onyx would yet remain dormant, had not the unrivalled power of the diamond been called forth to the artist's assistance. The carnelian, the agate, or Cairn-Gorm cannot be engraved by any other substance; every crest or letter cut on hard stone, is indebted to the diamond—This is not all, for without it blocks of crystal could not be cut into slices for spectacles—agate for snuff-boxes, &c.

In the breaking of Diamonds, *bits*, *shivers*, an eighth of an inch long, sometimes occur, which if properly proportioned are in demand and used for drilling holes in glass, china, &c.

Diamond merchants have adopted a very delicate and highly honorable method of offering polished Diamonds for sale — they employ confidential men, to take brilliants of various qualities, in separate lots, to the trade; their weight and price are generally marked on the paper in which they are folded. If a particular parcel is found desirable, but thought to be charged too high, an offer a little lower may be made: in which case the intended purchaser is allowed to affix his seal upon the lot, until the principal is made acquainted; then, if the terms are not approved, the employee returns with them, and requests the seal to be broken. Thus, during the negotiation, which often continues several days, the lot cannot be exhibited or hacknied through the trade.

SECT. IV.

Physical and Chemical Characters of the Diamond.

It is the object of the present chapter to point out to the reader such of the peculiar characteristics of the Diamond as may enable him to distinguish it from any other substance, especially in its rough state, and consequently to detect any imposition which may be attempted to be practised upon him.

Rough Diamonds occur under the most beautiful and regular geometric forms, their lustre and color frequently resemble Gum Arabic; they often exhibit a polished appearance, more particularly the brown stones, others are dull, indented, rough, shewing their laminæ, and some are round. If, as might

possibly be the case, a stone of the latter description was shewn to a person who had never seen a Diamond, although he might not be able to decide what it was, yet after examination he would pronounce it to be very unlike, and very different from any pebble he had met with before.

THE most common form of rough Diamonds is the octahedron, variously modified on the edges with planes, and low pyramids on each face of the triangles. The next is the dodecahedron, which occurs also variously modified, both on its edges and planes: others are flat and triangular (heliotrope), these are termed *veiny*, and being thin, are generally split and cut into roses. The rarest form is the cube. No substance in the Mineral Kingdom displays in miniature such beautiful variety of regular solids as the Diamond, which are as captivating to the connoisseur, as the finest brilliant can be to the wearer.

GENERALLY speaking, the degree of polish which a stone is capable of receiving, depends upon its hardness. That of the Diamond, which renders it so difficult to be cut and manufactured, enables it to retain unimpaired the lustre which it has originally received.

SMALL particles, laid on a new anvil and struck with a hammer, will indent both, and in some cases will not be broken. Yet with this intensity of hardness the Diamond is far from being difficult of fracture: a slight blow often causes it to split, and the fine edge of a brilliant is frequently injured by clumsy workmen. I have known one to be chipped by falling on a boarded floor.

A REGULAR formed Diamond, if lightly struck in the direction of the laminæ, will split easily; indeed it admits of cleavage in four directions, and I possess a perfect octahedron formed by cleavage. Spheroidal Diamonds break with

a rough fracture; these are generally called *Diamonds of nature.* The fracture of this gem is the criterion sometimes relied on by the overseers of the mines in Brazil. When a stone is delivered to them of a rude appearance, both ill formed and of a bad color, they have recourse to the hammer, especially if it exceed in size the Diamonds usually met with; they hold it upon a hard substance, and give it a sharp blow, should the fracture prove distinctly lamellar they are convinced that it is a true Diamond. In the treasury at Rio de Janeiro, I noticed three or four flat pieces of a bad brown color, an inch long by half an inch in breadth, and about one eighth in thickness.—To this rough kind of experiment may be attributed the fragments occasionally met with.

DIAMONDS may be distinguished by the senses of hearing and feeling, in the following manner. If two diamonds be held between the finger and thumb, and rubbed strongly together, a peculiar grating noise will be pro-

duced accompanied with a particular sensation on the nerves in contact with them—Or, if a diamond and a pebble, of equal size, be rubbed together in the same manner, the diamond will not be easily moved, as its projecting surface will penetrate the pebble.

To ascertain the supposed phosphorescence of diamonds I have tried many experiments (described by authors) without any satisfactory result, nor have my friends had any better success, *even in a single instance.*

THE combustion of the Diamond is a property very generally known. It burns with great brilliancy under a flame urged by oxygen gas; and if exposed on a support of clay to a strong heat, it may be totally consumed*.

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* The Author has effected a sensible alteration on fragments with the blow-pipe.

THE following experiment is worthy of being recorded. A small portion of iron was put into a crucible with a fragment of a Diamond, and exposed to a strong heat; on examination the iron was found to be converted into steel.

DIAMONDS of bad color are often improved by being exposed to a certain degree of heat in a small crucible, or the bowl of a tobacco-pipe, surrounded in some instances with borax. It is necessary for the vessel to be closely filled with charcoal, to prevent the admission of air.

THE Diamond possesses double refraction, which is rather difficult to discover. By friction it becomes electric, but continues so only a few minutes.

SECT. V.

Natural History, Localities, &c.

THE places where Diamonds have been found in modern times are — the central and southern parts of India, the peninsula of Malacca, the Island of Borneo, and some mountainous districts in the kingdom of Brazil, more particularly Serro do Frio. In the latter place, which is peculiarly celebrated, they are found in rivers or rivulets, in the banks adjoining water courses, and in ravines. The Diamond is invariably found mixed with the alluvial soil. This soil constitutes a thin stratum of gravel, resting upon Granite. On the banks and in ravines, the stratum is covered with vegetable earth more or less thick. If quartz pebbles, clay slate, brown Iron Ore, and Iron Sand con-

stitute the alluvium*, they are considered good indications. In one part of the Diamond District the *cascalho* forms a solid breccia, cementation having taken place from the oxidation of the iron: in this mass Diamonds and gold are sometimes found enveloped†.

To explain in a more particular manner the general locality of the Diamond, I will suppose a valley to be formed by mountains of granite; through which runs a rivulet, having on its margin gradually rising hillocks or plains, more or less distant from the base of the mountains. It is by analogy that the presence of the precious gem in such a situation is to be inferred, and hence a little geological experience is highly necessary. Diamonds having been found in ravines, formed by such

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* This soil is called *cascalho*.

† The Author possesses a piece of breccia enveloping Diamond.

mountains it is fair to presume that they may occur in others of a similar character. For ascertaining this, the experiment is easy, and demands no expenditure of capital for excavating ground either by labor or machinery. The mining for Diamonds is a much more simple operation. The mode of proceeding would be as follows: I should endeavour to procure some of the alluvium from the bottom of one of the deepest places in the rivulet; or if any little sand-bank appeared dry, I should remove the sand and mud from the surface, and scrape the gravel up, continuing this operation until I came to the solid rock, which is seldom more than two or three feet below the surface, and frequently only a few inches. I should begin the examination by putting a shovel-full of it into a bowl, commonly called by the miners a *gamella*, which is about 18 inches in diameter, and 10 deep, of a conical form, tapering to a point; having filled up the vessel with

water, I should agitate it with my hand in all directions, and, when the water became muddy, pour it off and add more to it, holding the gamella with my left hand, and stirring the gravel with my right, repeating the change of the water, until the earthy particles were dissolved, and the pebbles clean washed. During this agitation, from the peculiar form of the vessel, the heaviest substances in the *cascalho* would have sunk lowest and remain undisturbed, the surface being in a tenfold degree more exposed to this sort of trituration than the bottom.—Having poured off the clear water and thrown away the stones from the surface, the remainder would require to be carefully examined; the diamonds, if any, being heavier than the pebbles, would be found at the bottom, and may easily be discovered through the medium of water, which gives them an additional lustre, so that they cannot be mis-

taken. They are never found with any crust upon them, but their exterior being often rough, they have been many times improperly so represented*.

If after continuing the examination for three or four days nothing of the kind was found, the place would be abandoned, without having occasioned five shillings' expense. If any of the precious gems presented themselves; methods would be taken to wash the gravel of the rivulets, and the banks, to the very rocks, on an extensive scale. It was by the abovementioned process, that the adventurous Portugueze, after penetrating into the interior, where they had to contend with the Anthropophagi, discovered their diamond and gold mines.

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* For a more particular account of the Diamond and Gold Districts, see the Author's Travels in Brazil.

Diamonds of the smallest size, of which the weight does not exceed the tenth of a carat, and even the fifth of a grain, are the most abundant*.

In the places where this gem is found, it appears quite out of its natural situation; nor has it yet been discovered in what substance it was originally formed.

It does not require much geological information to determine, with tolerable certainty, whether alluvial soil contain gold and diamonds; and after having acquired a little experience, any one would attain a tact that might enable him to distinguish at once, a bolsa of Indian diamonds from those of Borneo,

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* Diamonds of a small size and peculiar form, are used by glaziers, and technically called points.

with little risk of mistake. Nay, I have frequently discriminated Diamonds found in one part of Brazil from those in another; but the distinctive characteristics are too subtle to admit of technical description, and may yet be said to be entirely unknown to the commercial dealers in precious stones.

SECT. VI.

Notice of Peculiar Diamonds.

THE largest of all the undoubted Diamonds is that mentioned by Tavernier, as being in the possession of the Grand Mogul. In form it is an oval, about the size of half a hen's egg. According to the same traveller, who weighed it, its weight was 296 carats; it was probably facetted all round in rose, as he does not state it was brilliant cut. This gem was found in the washings near Caldore, to the east of Golconda, about the year 1550.

A LARGE Diamond of a singular form, weighing 193 carats, is said to have represented the eye of an idol, and to have been stolen from its position by a French soldier, who escaped with it to Madras, where he sold it for about

£2000, to the captain of a ship; by whom it was disposed of in Europe for about £20,000. At length, it fell into the hands of a merchant, who sold it to Prince Orloff for the late empress Catherine of Russia, for the sum of £90,000 in cash, an annuity of £4000 more, and a title of nobility. In a former edition I stated that this diamond belonged to Nadir Shah; but this may be doubted, as the Asiatics rarely part with Diamonds of a large size; nor do I believe that a single instance of the kind is known to have occurred.

The Pitt or Regent Diamond is said to have been found in Malacca. It was purchased by Mr. Pitt, when Governor of Bencoolen, for less than £20,000; and weighed 410 carats.—He brought it to London, had it cut in brilliant, and sold it to the Duke of Orleans, regent of France, for £135,000, five thousand of which was expended in the negotiation, deli-

very, &c. The cutting and polishing this gem occupied above two years; the whole expense of which *is said* to have fallen little short of £3000. The fragments which were split or sawn from it were valued at some thousands. It weighs 136¼ carats, and may justly be deemed the FINEST BRILLIANT IN EUROPE. By calculation it is worth more than the sum paid for it, and in 1791 a committee of jewellers valued it at above £400,000.

THE emperor of Austria possesses a fine yellow Diamond, the largest of that color known; it is oblong and cut in rose, weighs above 139¼ carats. It formerly was in the possession of the Grand Duke of Tuscany.

THE Pigott Diamond is a brilliant of great surface both in table and girdle, but is considered not of sufficient depth. Its weight is 49 carats. This gem is valued at £40,000, and was, about 20 years ago, made the subject

of a public lottery. It became the property of a young man who sold it at a low price; it was again disposed of, and afterwards passed into the possession of a jeweller in the city, and is said to have been lately sold to the Pacha of Egypt for £30,000. It may justly be called a Diamond of the first water, and rank amongst the finest in Europe.

A SUPERLATIVELY fine blue Diamond weighing 44 carats, and valued at £30,000, formerly the property of Mr. Eliason, an eminent Diamond merchant, is now said to be in the possession of our most gracious sovereign. This unrivalled gem is of a deep sapphire blue, and from its rarity and color, might have been estimated at a higher sum. It has found its most worthy destination in passing into the possession of a monarch, whose refined taste has ever been conspicuous in the highest degree.

A GREEN brilliant of exquisite beauty and

great size, but of irregular form, is worn by the king of Saxony, when in court dress, as a button to the plume in his hat.

A DIAMOND of great purity, but of a bad form, has lately arrived from India. It is called the *Nassuc*, having been taken in the Peishwa's baggage during the Mahratta war. It weighs 79 carats and 2 grains, yet it is valued at only £30,000. Its form is triangular, and it is cut and polished so as to retain the greatest possible weight; but it exhibits none of the qualities which it would so proudly display if it had been well proportioned.

THE king of Portugal has a rough Diamond, which weighs nearly an ounce troy. It was found in the alluvium of the river Abaité; its form approximates to the octahedron. No potentate is so rich in Diamonds as this monarch: I had the honor of being shewn his suit and estimated it at more than two millions.

A FINE stone, weighing 101 carats, called the Nizam Diamond, was brought from India by Governor Hastings; it made a most perfect brilliant, and was presented to our late gracious Queen Charlotte.

AN individual lately received a rough Diamond from Brazil, above 90 carats; which, when formed into brilliant, weighed nearly 32: it cost £200 in workmanship.

IN the crown jewels of France is a fine light blue brilliant, which weighs 67½ carats, and was estimated at above £100,000.

IN commerce Diamonds of magnitude rarely compensate the possessor, there being so few purchasers. A friend of mine told me, that his father bought a fine brilliant for £12,000, and kept it twenty years without being able to dispose of it. Circumstances at length arose which rendered it necessary for

him to part with it, on the best terms that could be obtained; it was sent all over Europe for two years and was at last sold for £9000!

THERE are in the hands of individuals brilliants of considerable magnitude, from 20 to 30 carats, and a rough Diamond has lately been imported that weighs above 80*.

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* Models of the principal Diamonds in Europe may be had of the author.

SECT. VII.

Commercial History of Rough Diamonds.

With the circumstances that led to the discovery of Diamonds in India, we are totally unacquainted; but in regard to the discovery of this gem in Brazil, the following account, which I have heard related by individuals in the country, to whom it had descended by tradition from the first adventurers, will be found generally correct.

About a century ago, that part of Brazil, called Serro do Frio, (meaning a lofty ridge where the climate is cold), was explored for gold; and in searching for this precious metal some singular substances, resembling pebbles, were occasionally met with, in regular geometric forms. The peculiar hue and lustre of some

particular specimens attracted the notice of the negroes, who shewed them to their masters, as pretty shining pebbles. They were preserved apart when met with, and gradually came into fashion as counters in playing at cards. The people were wholly ignorant of their value, though their striking appearance, and their regularity of form created a general interest in them, similar to that which induces persons to collect pebbles and shells on the beach at Scarborough, &c.

In this state the gems remained for some time, until an officer arrived, who had been in India, and was reputed to be a mathematician. At the social parties which he visited, these pretty counters attracted his notice. Having obtained some, he examined them more minutely when alone, and was particularly struck with their geometrical symmetry of form. He compared them with common pebbles of the same bulk, which he purposely

gathered; but he could not find any that at all resembled them in regularity. After some time the number of these stones augmented, and all persons in the habit of amusing themselves with cards, possessed a larger or smaller number, which circulated among them without exciting the least surmise as to their real worth.

The currency of the country was gold dust, in various quantities, as an eighth of an ounce, half an ounce, &c., and of course, small scales were in very general use. The officer already mentioned, conceived the idea of weighing one of these counters against a pebble of equal size; and having done so, he found that the weight of the one considerably exceeded the weight of the other. He then tried to make an impression upon one of these counters, by rubbing it on a stone with water; but it resisted all his efforts, while a plane was produced on the pebble by the

labor of a few minutes. When an opportu nity presented itself, he sent a handful of the counters by a friend to Lisbon, for the purpose of having them examined; these were given to lapidaries (who never work diamonds, and perhaps had never seen one in its native state): they could only say, the stones were too hard for their tools. At length, by mere accident, the Dutch consul saw them; and gave his opinion that they were Diamonds. Some were immediately forwarded to Holland, where they were manufactured into brilliants, and pronounced to be diamonds, equal in quality to those from Golconda, or any other part of India. The returning fleet carried this favorable news, to Rio de Janeiro, whence it was rapidly communicated to the interior, and fortunate was the man who could procure a large share of these hitherto pretty pebbles—but now Diamonds. They were quickly bought up; and the counters, which had for a year or two been so carelessly handed about, became

the property of three or four individuals, in as many days.

In consequence of this favorable report, diamonds were now sought for, with the greatest avidity. Extensive speculations took place, and the diamonds arrived in Europe in such abundance, as to excite an apprehension, that these valuable gems would be greatly depreciated. To counteract this, a report was industriously circulated, that the Brazillian diamonds were decidedly inferior to the Oriental. Others, interested in the trade of diamonds, denied that these newly introduced gems were the produce of America, and declared them to be the refuse of the Indian mines, sent from Hindostan to Goa, and thence transmitted to Rio de Janeiro, on their passage to Lisbon. These misrepresentations excited throughout Europe a great prejudice against Brazillian diamonds. They soon fell however into the hands of a few persons, who

knew better how to manage the business— Foreseeing that their government would not long remain indifferent to so splendid a prize, they bought all that were offered, and devised the following ingenious expedient for counteracting the prejudices, which had been so insidiously raised. They secretly transmitted the Brazillian Diamonds to Goa, and thence to Bengal, where they were baptized legitimate Oriental Diamonds (Rocca Velha) bought at high prices, made up in bolsas of a certain weight, and transmitted to England; whence they were disseminated over Europe. They were every where received by the consignees, merchants, and manufacturers of brilliants, as genuine East Indian Diamonds.— Thus brought into fair competition, they were found not at all inferior to the finest gems from Golconda. The former prejudice was soon abandoned by the trade; but it made a lasting impression on persons little acquainted with diamonds, and it still subsists. Pur-

chasers will sometimes speak with contempt of a Brazil brilliant, and this delusion gives the vender a favorable opportunity for selling what he will call a real Golconda Diamond at a much higher price. The actual, or supposed native country of a diamond, is not at all considered in estimating its commercial value.

THE far famed, and much extolled diamond-mines of Golconda, are said to be nearly exhausted. The thousands of inhabitants composing its entire population, who were for so many years employed in washing the earth for these gems, have drained all the riches from this once distinguished territory, and the mines are now abandoned.

A COMPANY, chiefly English, raised a capital of £30,000, and with the assistance of the native Rajah, engaged the poor inhabitants in their former occupation; but, after a lapse of three years, finding their capital in a rapid

decline, they were obliged to relinquish the undertaking, and retired with a loss of one third of their funds.

From the best accounts that I have been able to procure, it appears that for some ages the native princes of India had employed from thirty to fifty thousand, or more, of their vassals, in the washing and search for Diamonds. So long as they collected as many as would cover the expenses incurred, the labor was continued. It would not be difficult to form a rude estimate of the amount of money thus acquired; and it is matter of great astonishment, that, in so many centuries, so few large Diamonds should have been found. In India, Diamonds of great size, as I have already observed, are never sold by the Rajahs, or persons of rank, but are preserved in families, from generation to generation, with religious care.

At one period, it was the practice to let out pieces of ground, of a certain number of square yards, at a fixed sum *per diem*, (according to the reputation of the soil), for each man employed in searching for Diamonds. If any were found, they were immediately weighed, and offered for sale on the spot to agents, who were sent from Madras, &c. for that purpose.

In the Diamond washings of India, sapphires, rubies, topazes, and aqua-marines, have been frequently met with.

The Diamonds from Borneo* are found in

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* The Rajah of Mattan, in Borneo, is possessed of a rude Diamond, said to weigh above 300 carats. A friend of mine, captain of an Indiaman, was permitted to see it, but was requested not to touch it; this gem was brought in on a gold salver, and was about the size of a common walnut; it had a blueish metallic lustre.

the manner described in treating of those of Brazil. A lot, or bolsa, always contains a larger proportion of bad, and a smaller quantity of good Diamonds, than is found in an equal lot from Brazil. They have also, generally, great exterior lustre, which is by no means a favorable symptom; many are quite dark brown, and of very high polish.

It may with truth be asserted, that Europe is almost wholly dependant on Brazil, for its supplies of Diamonds.

This lucrative commerce was formerly in the hands of the Dutch. On the discovery of Diamonds in Brazil, the consul of that nation, after the Portuguese government had taken the mines into their own hands, contracted for all that should be disposed of. The Dutch, by means of their agents, were equally alert in India; and thus they succeeded in obtaining a valuable branch of trade, while they secured

to their own workmen the profitable employment of cutting and polishing Diamonds.—They also became possessed of the most valuable colored stones, and thus rendered the sovereign princes and most opulent individuals in Europe, tributary to them for the rarest and most valued of all precious substances.

Besides the annual importation of Diamonds into Europe through the ordinary channels, there have been, in the course of the last eighty or ninety years, two remarkable influxes, which require to be noticed. The first was that which took place from Brazil, before the trade was monopolized and regulated by the Portuguese government. The second occurred at the epoch of the French revolution, when the nobles and other emigrants, who took refuge in England, brought with them large quantities of diamonds, which, from the pressure of necessity, were soon brought to market, and were generally disposed of, at a low

sum, to the jewellers. The prices given had a relation rather to the exigencies of the sellers, than to the value of the article; for the regular sale price did not on this account suffer the smallest abatement.

Though commerce of every kind has been, and ever will be, subject to fluctuation, yet that of diamonds is of all others least liable to it, so far as concerns what may be termed saleable stones, by which is meant those that are not remarkably large. Diamonds of considerable size are so rare as to render their value in many cases arbitrary. Few persons can afford to enter into competition in the purchase of first rate gems, and hence they will probably always continue to be slow of sale in Europe. The political state of the continent for the last twenty years, has been deemed peculiarly unfavorable for the disposal of such diamonds as demand for their purchase

an expenditure of perhaps forty or fifty thousand pounds.

As a very large property, both in this kingdom and in other countries of Europe, is vested in diamonds, it may be interesting to be informed, that not only the price of these gems has for several years been, upon the whole, gradually rising, but that it is likely to continue on the advance. At the present time, indeed, and for the last few years, there has been a dull sale of Diamonds in England, nor did the coronation occasion a demand worth notice; but on the continent the trade has been steady, and rough diamonds have been constantly rising in price. That this advance will be progressive, may be presumed from the fact, that the best diamond ground now known, the Serro do Frio, in Brazil, has assuredly passed the zenith of its prosperity. I went over the greater part of what is yet reserved,

and still remains to be worked, and I conceive that there would be no difficulty in calculating the length of time in which the present number of workmen may reduce it to a state of exhaustion, like that of the far-famed Golconda. The average annual produce of future years may be estimated on the ratio of the amount obtained from that portion which has been already worked. Brazil may be said to furnish Europe with 25,000 or 30,000 carats *per annum*, of rough diamonds, which, if reduced to brilliants, may make an influx into the market, of 8,000 or 9,000 carats annually.

The Diamond mines in Brazil belong to the Crown; and any trade whatever in these gems, even the possession of one, is declared contraband, and is visited with the severest punishment. Yet they are not unfrequently offered for sale by private individuals who contrive to pass the guards, and convey them from the

interior to Rio de Janeiro, &c*. The government Diamonds, however, form far the greater part of the trade. The district of Serro do Frio, where they are found, is of small extent, and the number of negroes constantly employed in washing for them, does not exceed two thousand. No one is allowed to enter this district without special permission; and if travellers are obliged to pass through it, they are always escorted by a soldier, and not allowed to make any stay. The principal town where the intendants and officers reside, is called *Tejuco*, but the mines or washings are at some distance from it. The Diamonds collected in the various parts of the district, are taken to the town, and secured in the treasury, in the presence of all, or at least three of the principal officers. They are annually sent to

* See Travels in Brazil.

Rio de Janeiro in the charge of a captain of cavalry, with a sufficient convoy, and are delivered to the treasurer and officers of government at that capital. Here the gems remain until it is determined to send them to Europe. During the last fifteen years they have been transmitted to England, but they will now probably revert to their former channel, and go to Lisbon. It was customary for the monarchs of Portugal to make choice of any rough Diamonds which pleased them, above the weight of twenty carats: and thus has been accumulated that costly suit now belonging to the present king of Portugal.

Before I conclude this section, it may be proper briefly to describe the manner in which the diamond-merchant proceeds to make his estimate in buying a bolsa or lot of Diamonds, whether of fifty carats, or five thousand. He first places them in a good light, on a sheet of white paper laid on a table, and then divides

or separates them* into various sets according to their size. Those stones which are bad colored, veiny, and round, are laid apart; then the large stones are separated, weighed, and carefully examined. Each of the lots is then weighed, and lastly the inferior stones. He calculates the separate value of each large

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* When the lot is large, for the purpose of more easily separating the greater stones from the smaller, the merchant has small sieves or boxes of tin, with numerous holes punched in them. One sieve, for instance, will suffer all Diamonds to pass through, which do not weigh two carats, retaining stones of that weight and larger. Another sieve, will suffer those to pass which are below a carat and a half, or a carat, and so of the rest. Thus the whole bolsa is divided into sets of stones which are nearly of equal weight.

A bolsa of Diamonds rarely contains any individual stones above four carats; all that exceed that weight being generally sold alone. Such lots may, on the average, be estimated at from forty to fifty shillings per carat. If they contain many stones not fit for manufacturing, (technically called *turn out*), they may be worth the lowest of the above-mentioned prices; and if very fine, they may sell for a few shillings above the higher price.

stone, and afterwards the value of the various parcels. His next object is to estimate the expense of making them into brilliants &c. the loss of weight in cutting, and the price they will probably sell for, when manufactured, and estimates their value accordingly.

It may here be observed that the commerce of rough Diamonds, is almost exclusively in the hands of respectable Jews; and, to the credit of that people, it should be added, that their dealings in them are liberal; they estimate the real value of the article, and offer the fair trade price; and I may state from my own experience in numerous transactions with them, that they rarely make any alteration in price, either in purchasing or selling.

Small lots of rough Diamonds are frequently brought by gentlemen from Brazil or India, and are offered by them to jewellers, who seldom venture to purchase, except at very in-

ferior prices. The following fact came under my own observation. A lot of sixty carats was offered for sale to a jeweller, who requested they might be left for examination, that their value might be ascertained. When the gentleman called again, he was informed that the Diamonds had been estimated by a workman at thirty-two shillings per carat. The owner, having given much more for them, appeared a little disappointed; some explanatory remarks were then thrown out respecting their inferiority, and a higher offer was made, which was declined. The same diamonds were afterwards disposed of at forty-eight shillings per carat!

SECT. VIII.

Art of Cutting, Splitting, Sawing, and Polishing Diamonds.*

THE object of cutting and polishing the Diamond is twofold. First, to divide the natural surface of the stone in a symmetrical manner, by means of a number of highly polished polygonal planes *(facets)*, and thus to bring out to the best advantage the wonderful refulgence of this beautiful gem; and secondly, by cutting away such flaws as may happen to be near the surface, to remove those blemishes that materially detract from its beauty, and consequently from its value.

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* The same workman is seldom a proficient in all these operations, but generally confines himself to one.

THE removal of flaws is a matter of great importance, for, owing to the form in which the diamond is cut, and its high degree of refrangibility, the smallest fault is infinitely multiplied, especially if near the *collet* *, and becomes obtrusively visible in every facet.—For this reason also, it is by no means an easy matter, at all times, to ascertain whether a flaw is, or is not superficial; but a person of experience will often purchase to great advantage stones appearing to be full of flaws, which in fact exist only on the surface.

THE principal object of the artist, when a rough diamond is put into his hands, is to examine carefully in what direction the stone ought to be cut, and where to form the girdle or spread of the brilliant. So much stress is laid by modern fashion on the superficial ex-

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* See page 77.

tent of a brilliant, that the old rules for proportioning its dimensions are now nearly obsolete: the diamond-cutters have almost discarded the use of measures, and, in forming the facets, trust wholly to the eye. If, however, the brilliant were formed according to the rules, it would be in the best proportion, and exhibit the greatest possible refulgence. At present it is the practice in cutting a diamond almost exclusively to consider which form the rough stone is best calculated to produce, without any regard to scientific accuracy.

As the octahedron is the most common form of rough diamonds, I will illustrate what I have to observe on the art of *cutting*, by supposing such a diamond, which is technically called a six-cornered stone, to be given to a workman to make into a brilliant. The table and collet are cut upon opposite solid angles, in a direction perpendicular to the axis of the crystal, and the facets obliquely, upon the la-

teral edges, and other four angles. It will be evident that the labor required to form the table and collet, must be considerably greater than is necessary for the facets, as the artist has to work directly across the laminæ: hence these are called the *hard points.* In working upon the other angles, a facet is produced with much less difficulty, it being cut in an oblique direction to the laminæ; in fact, if the same force were exerted upon them as is applied to the others, perhaps a flaw would be produced. It is probably on account of this nice adaptation of force required for the various parts of the operation, that the fatiguing process of manual labor has not been superseded by machinery.

The operation of cutting is commenced by imbedding the diamond in strong cement, fixed at the end of a stout spindle-shaped stick about a foot long, with that portion only projecting, the removal of which is to form the

first facet. Another diamond* is employed for this purpose, fixed as the former, with one of the solid angles projecting. To collect the powder and shivers that are detached during the process, the cutting is performed over a strong box, five or six inches long, furnished with a false bottom, perforated with excessively minute holes, in order to sift, as it were, the dust from the shivers; and also with two upright iron pegs fixed on the sides, for the workman to support and steady the sticks and his fingers against, while with a short repeated stroke, somewhat between rubbing and cutting, he is laboriously wearing away the dia-

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* An inferior diamond, or a piece of bort, is generally used; but a skilful workman, if he has a lot to cut, will select those stones which suit his purpose, and so employ one against another, as to form two at the same time. The average work of a diamond-cutter is two carats *per diem;* but to polish the same requires twice that time. The usual price of cutting and polishing is 14s. per carat,

mond in that part where the facet is to be placed. This being done, the cement is softened by heat, and the position of the diamond is changed, in order to bring a fresh part under the operation of cutting. When all the facets have been placed upon the surface of the diamond, the cutting is completed. The stone, if examined, now presents rough edges and dull surfaces, resembling a piece of unpolished glass: these imperfections are removed by polishing, which gives the greatest sharpness to the angles.

The shape of many Diamonds is so irregular, that it is necessary to remove pieces of considerable magnitude, in order to bring them to a form proper for cutting. Where the lines of these proposed sections coincide with the lamellar structure of the stone, the workman has recourse to the delicate and perhaps somewhat hazardous operation of *splitting*, by which a double advantage is obtained. In the

first place there is a great saving of time, and in the second place the pieces are themselves sufficiently large to admit of being cut and polished. The method of splitting is made a great mystery of: thus much however may be mentioned, that when the direction in which the section is to be made has been determined on, it is marked by a line cut by a *sharp**; the stone is afterwards fixed by strong cement in the proper position in a stick, and then, by the application of a splitting knife, the section is effected by a smart blow.

It sometimes happens that the foul and flaws occur in a part of the diamond which cannot be split off, the laminæ lying in a contrary direction; recourse must then be had to *sawing*, which is performed as follows—The

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* When a small diamond is broken into four parts, the edge of the quadrant is called a *sharp*.

diamond is cemented to a small block of wood, which is firmly fixed to the table, and a line is made with a *sharp* where the division is intended to take place, which is afterwards filled with diamond-powder and olive-oil: the sawing is then commenced, and if the stone be large, the labor of eight or ten months is sometimes required to complete the operation. The saw is made of a fine wire of brass or iron, attached to the two ends of a piece of cane or whalebone, the teeth being formed by the particles of diamond-powder, which become imbedded in the wire, as soon as it is applied to the line. In large ill-shaped stones, sawing is practised to advantage, but this method is not advisable, unless the part to be removed is valuable.

The Diamond being thus brought to the required form, the next object is to *polish* the facets. The polishing mill is an extremely simple machine, consisting of a circular horizon-

tal plate of cast iron, fourteen or fifteen inches in diameter, (called a *skive*,)* fixed on a spindle, and capable of being put into rapid motion by means of a larger wheel, five or six feet in diameter, and turned by an assistant. In order to keep the Diamond perfectly steady while the polishing of each facet is going on, the following contrivance is had recourse to. A copper cup (called a *dopp*,) about three quarters of an inch in depth and the same in width, and furnished with a stem about four inches long, of stout copper wire, is filled with plumber's solder, which projects in a conical form beyond the rim of the cup: in the apex of this cone, the solder being softened by heat, the diamond is imbedded with the facets to be po-

* The surface of the plate is roughened by the application of a grit-stone, in order that it may better retain the mixture of olive-oil and diamond-powder, with which the skive is charged, and which is renewed, as occasion requires.

lished projecting. The stem of the cup is now put into very powerful pincers *(tongs)*, not unlike snuffers, which screw up with a nut and a wrench or lever, and thus hold it perfectly tight. In this position the diamond is carefully placed on the skive, the pincers resting on their legs on the bench that supports the mill, and pressing at the same time against an upright iron peg; the broad part of the tongs is next loaded with weights, to increase the pressure of the diamond upon the skive. The skive being previously set in motion, at the rate of about 200 revolutions in a minute, the process of polishing is begun. The diamond is taken up and examined from time to time, and is adjusted so as give the facet its true form*. The heat occasioned by the

* When the facet is cut exactly in the direction of the laminæ, it will not receive a polish; in this case the stone must be inclined.

friction is at all times considerable, and when the pincers are heavily loaden, as in polishing large stones, it occasionally increases to such a degree as to soften the solder and displace the diamond; when this accident occurs, it often produces a flaw, and always tears up the surface of the *skive*. Three or four diamonds may be polished at the same time; and to give each its proper share of attention, is as much as one person can well manage*.

DIAMONDS are brilliant cut, rose cut, table cut, and *lasques*. The brilliant is deservedly in the highest estimation, as it is the form which shows to the greatest advantage the peculiar lustre of the gem. The brilliant † may

* Formerly, both in India and Europe, before the art of cutting was discovered, diamonds were worn down upon the skive. When the mines of Golconda were in their zenith, 400 skives were constantly employed upon the spot.

† See plate I. fig. 4.

be considered as formed of two truncated pyramids united together by one common base, the upper pyramid being much more deeply truncated than the lower. The plane formed by the truncature of the upper pyramid is called the *table* (*a*); that formed by the truncature of the lower is called the *collet* (*b*); the common base is called the *girdle* (*c*); the space between the table and the girdle is the *bizel* (*d*), and that between the girdle and the collet is the *collet-side* (*e*). The inclination of the facets to the girdle ought to be 45°, and the bizel should be inclined to the table at the supplement of the same angle; it is absolutely necessary that the collet should be exactly parallel to the table.—If these measurements are accurately observed, the superlative splendor of the diamond will be displayed to the greatest advantage. The rule to be adopted in regulating the height of the brilliant is, (supposing the stone to be a regular octahedron), to divide it into eigh-

teen parts. Five-eighteenths are cut away to form the table, and one-eighteenth for the collet, which will reduce the height one-third, and the diameter of the collet will be one-fifth of the table. If these distances are preserved, the collet will play in the centre of every facet; but if there be any variation, it will play higher or lower, and greatly diminish the intensity of lustre. The corners are truncated, to correspond with the table; the bizel is formed by eight lozenges and twenty-four triangles, and the collet-side by four large irregular pentagons, and four lozenges, radiating from the collet as a centre, and bordered by sixteen triangles at the girdle; thus making, in the whole, fifty-six facets*. The triangles on the bizel, adjacent to the girdle, are called *skill facets*, and those which join the table, *star facets;* those upon the collet-side

* See plate I. fig. 5 and 6.

are called *under skill facets*, and the sides or pentagons, *pavilion facets*.

MANY of the foreign-cut brilliants have the facets inclined at an angle of 50°, or even more, the principal study with foreign workmen being to retain as much weight as possible.—These stones are sometimes reduced to the above standard by English artists, it being found that the additional expense in recutting the facets and the consequent loss of weight is fully compensated by the increased brilliancy of the gem. The brilliant is set with the table side upwards, and the collet-side implanted in the cavity made to receive the diamond.

THE regular rose diamond*, is the form given to those stones, the spread of which is

* See plate I. fig. 7.

too great in proportion to their depth to admit of being brilliant cut. It is formed by covering the rounded surface of the stone with equilateral triangles, placed base to base, making the figure of a rhomb.

THE table diamond* is the least beautiful except the lasques, and is made of those stones, which, with a considerable breadth, have only a very trifling depth. It is produced by a series of diminishing four-sided planes below the girdle; and the bizel is formed by one, two, or three of the same.

LASQUES† are formed from flat or veiny diamonds. They are quite unknown to European workmen, and are only made in India.

THE polishing of the girdle should be par-

* See plate I. fig. 10. † See plate I. fig. 11, 12.

ticularly attended to in all these modes of cutting, as a rough edge, when seen through some of the facets, has often the appearance of a flaw, and diminishes the brilliancy of the stone: and unless the girdle is perfectly smooth, thin diamonds are liable to be damaged by the pressure required to secure them in their setting.

Diamonds from one carat to four or five carats, when skilfully cut into brilliants, lose in the process a little less than half their weight: hence the value of a cut stone is twice that of a rough one of equal weight, exclusive of the cost of workmanship.

The diamond cutters of England are confessedly the best in Europe, but the Dutch have engrossed almost all the trade, as we are unable to compete with their prices, labor being so much lower in Holland.

DIAMONDS are always equally in fashion but the mode of setting varies according to caprice, or the desire of novelty: hence the jeweller has perpetual opportunities of exercising and displaying the inventive elegance of his taste*.

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* It is customary with jewellers when they receive an order to make a particular design, to fix the diamonds in black or white wax in the form required.—If they are breathed upon until the glare or lustre is destroyed, any imperfections may be easily discovered.

CHAPTER II.

ON COLORED STONES.

SECT. I.—*Oriental Stones*, Sapphire, Ruby, Amethyst, and Topaz.*

THESE gems are considered to belong to the same class, having the same chemical characters, specific gravity, and hardness, differing only in color.

THE perfect Sapphire first claims our attention. When pure, its color is of a clear and

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* The stones of this class, being superior to all others in hardness and brilliancy, were formerly exclusively called *precious.* They are all varieties of sapphire—the ruby is sometimes called the Red Sapphire; the oriental topaz, the Yellow Sapphire, &c.

bright Indigo blue, united to a high degree of translucency; but it more generally occurs pale blue or cloudy; and not unfrequently transparent in one part, and spotted and streaked of a dark inky blue in the other.—It is found in the streams and rivers in Ceylon, and various parts of India, but more particularly in the kingdom of Pegu, where it is met with in rounded or crystallized fragments, generally small, seldom exceeding the size of a a common nut, though sometimes much larger.

THERE are several choice specimens in Europe, and one of the finest is in the possession of P. H. Hope, Esq. which weighs 133 carats, and is without a flaw. In perfection this gem is unrivalled, and although not so large as some, it surpasses all in brilliancy and beauty. It is cut in exact propōrtion, and is set round with brilliants.

SAPPHIRES of less note are by no means rare, and smaller stones of ten or twenty carats are always in the market. They are generally offered for sale in lots cut and polished, consisting of stones of various sizes and quality, and of the value of from twenty to sixty shillings per carat. I possess one of eighteen carats, for which I paid £30. The price of stones of three or four carats, may be said to be capricious, depending on the brilliancy of the gem, and the peculiar beauty of its color.

A VERY remarkable variety of this gem is the Asteria* or Star-stone. This is a semi-

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* The Asteria is produced by cutting the stone across, *(en cabochon)*, and if the primitive crystal (the rhomboid) should be in the centre, the rays of light entering the stone will be refracted and diverge from the angle of the nucleus in the form of a star with six rays.

transparent sapphire with a pale cloudy tinge, and exhibiting the appearance of a star with six radii, which sparkles with great brilliancy as its position is varied in the rays of the sun.

This gem, when extremely fine, is rare.—The best specimen known, I had the honor to sell for the private collection of his Majesty Louis XVIII.*

THE ORIENTAL RUBY

Is esteemed the most valuable of precious stones, and is supposed to differ from the Sapphire in color alone; the hardness, form of crystallization, and specific gravity, being very nearly the same†.

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* This Asteria is represented in the plate of colored stones: it is considered of unrivalled beauty.

† The Asteria is also produced in the ruby, by the same

The color of this gem, when perfect, is, by transmitted light, a cochineal red, presenting a richness of hue the most exquisite and unrivalled; it is however in general more or less pale, and often mixed with blue, hence it occurs rose red, peach blossom red, and lilac blue, passing into the Amethyst, which we shall notice hereafter.

The monarchs of Pegu, Siam, and Ava, monopolize rubies of the greatest beauty, as the sovereigns of India have done with regard to the largest Diamonds. The finest ruby in the world is in the possession of the first of these potentates, its purity has passed into a proverb, and its worth in Pegu, compared with gold, is said to be inestimable.—The Subah of Decan is also in possession

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cause as in the sapphire. It is very small and of rare occurrence.

of one remarkably fine, which he wears as an armlet.

EUROPEAN princes cannot boast of any of first rate magnitude. Henry VIII. is decorated in most of his portraits with a magnificent collar of rubies; but it no longer exists among the Crown jewels, and it is unknown what has become of it.

A SUPERLATIVELY fine ruby of the most enchanting color and greatest perfection, lately arrived in this country; it was purchased by Mr. Hope, whose well known taste and liberality far surpasses any eulogium. This gem has been recut since it came into that gentleman's collection, and may be justly said to be the finest colored stone in Europe.

RUBIES of ten carats are extremely rare and valuable; one of twenty-two grains was sold for £160; and another which I possessed,

weighing four carats, sold for £60; it would require to be recut, when it would be reduced to thirteen or fourteen grains.

RUBIES in lots, Indian cut, of small sizes and of different qualities, are at all times to be had, and sell at from fifteen to sixty-five shillings per carat; but a perfect stone of a carat or six grains may be deemed rare, and falls little short of the value of the Diamond: nay, in some cases, rubies of two, three, or four carats, if *very fine*, are much scarcer, and even more valuable than diamonds of equal weight.

I HAVE frequently been called upon to value stones in the India-house, &c. but I have rarely met with a good ruby above a carat and a half.

FROM this gem I pass to another of the same family, which if it yields in beauty, is yet more rare.

THE ORIENTAL AMETHYST *or* VIOLET SAPPHIRE.

This interesting gem appears to unite the blue of the sapphire with the red of the ruby, so nicely blended as to produce the most perfect violet color. Language is insufficient to express the beautiful hue and lustre of this gem—indeed the captivating effect and fascinating qualities of these precious stones set description at defiance.

The finest Oriental Amethyst in Europe is also in the valuable collection of Mr. Hope; it is of considerable size, though smaller than his sapphire or ruby: it is finely proportioned, and exceeds an inch in its greatest diameter. It has the peculiar property of transmitting, by day-light, the most beautiful and perfect violet color; but by candle-light a decided blue! This stone was in the possession of a noble-

man of great taste and judgment, from whose collection it was, for a valuable consideration, transferred to Mr. Hope.

THE Oriental Amethyst is extremely scarce, and I have rarely seen one offered for sale, unless very small and inferior in color.

THE ORIENTAL TOPAZ

Is of a light yellow or straw color, and when pure possesses great beauty. It occurs in the same localities with the preceding, is less common than the Sapphire, but not so rare or valuable as the Ruby or Amethyst. When perfect, and skilfully cut and polished, it is highly splendent, and resembles the yellow diamond, for which it may have been sold.

THIS gem is also of considerable value: a perfect stone of twelve carats, of the finest qua-

lity, was sold for above £120; but I have known much larger sold for less; the price depending entirely on brilliancy and perfection. I possess five or six, not very fine, which I purchased at forty shillings per carat; they weigh from about two carats to sixteen grains each.

SAPPHIRES exhibiting two colors are occasionally met with, but they may be deemed rare. The ruby and sapphire frequently present a chatoyant or cloudy appearance, which is termed *milky*, and is considered an imperfection, except in the Asteria, which owes its principal beauty to this character. I have seen inferior sapphires so dense as to appear black; and I accidentally met with two or three of a dull green tinge, but very different from the color of an emerald. Transparent and opalescent sapphires are not uncommon; they

possess a considerable degree of brilliancy, but are not to be compared with the diamond, for which, as the French authors assert, they have been often sold.

In preparing stones of this class for the purposes of jewellery, for instance, the sapphire or ruby, the first object to be considered is the intensity of color, which must alone regulate the proportion of the gem, and the sort of work that must be put upon it; taking it as a general rule that the beauty of all precious stones depends on the skill of the workman, for, as an inferior stone is much improved by the best workmanship, so is a fine and perfect gem deteriorated and rendered of little value, if finished by an inferior lapidary.

If a sapphire, ruby, or amethyst is very highly colored, the gem need not have the thickness or depth that a stone of less color

would require; the four-sided facets, (steps*), may also be made much larger, which will greatly add to its splendor. The table should be large, and must be regulated by the judgment of the workman, as well as the bizel, and which, however low, ought to have double work upon it. If the color is light, the stone will require greater thickness and more work, that is, the facets must be smaller, and separated by ribs at equal distances: the bizel must in this case be higher and full of work, and the table consequently less; a spheroidal form may also be given to the stone. Small facets (technically a deal of work) greatly assist the color, as each facet refracts a portion of the transmitted light to the table, which gives it additional intensity.

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* Coloredstones should be cut in steps, see frontispiece, to a point or ridge on the collet-side; and if very thin, the bizel and collet-side should have a spheroidal outline.

THE topaz and white sapphire should have considerable thickness, and although they are sometimes cut in brilliant, yet I prefer the steps; as in the latter form, they refract more light, (have more play), and appear with greater lustre.

SECT. II.

Chrysoberyl or Oriental Chrysolite, and Cymophane.*

THE chrysoberyl, though differing in some characters from the sapphire, yet closely approximates to it in hardness and specific gravity. When pure, it is of a gold yellow color intermixed with green, exhibiting a peculiar richness of tint, and in lustre yields only to the brilliant.

IT occurs in Brazil, in the alluvial soil, associating with diamonds, usually in grains or rounded pieces, and sometimes in crystals: a stone of twenty carats is rarely met with.

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* The common Chrysolite is a different substance, very inferior in hardness.

In that country it is esteemed the most valuable of all colored stones; and although but recently introduced into Europe, it is rapidly rising in public estimation.

The high lustre and exquisite polish which it is capable of receiving, enables it to sustain a competition with the yellow diamond; and so great is its brilliancy by candle-light, that while the transcendant splendor of the diamond destroys the effect of other stones, this is able to support its presence with unimpaired beauty.

This gem is very difficult to be cut, and few lapidaries are capable of doing justice to it. The Chrysolite is the only colored stone that shows to the greatest advantage when formed into brilliant; but thin stones must be cut in steps.

CYMOPHANE, *or* OPALESCENT CHRYSOBERYL.

Is a chatoyant variety of the preceding gem; it emits a luminous white ray, which changes its position according as the stone receives the light. Its principal estimation in the eye of the connoisseur arises from that circumstance, which on the other hand renders it of little value to the jeweller, the brilliant translucency of the chrysoberyl being more esteemed by the public. The Cymophane is generally cut *en cabochon*, that it may better shew the play of light from whence it derives its name.

SECT. III.

On the Ruby—Spinelle and Balais.

The Spinelle, when perfect, is a gem of great value and scarcity; its color is a fine, full carmine or rose red, which varies in intensity; in hardness and specific gravity it is inferior to the oriental ruby, and it differs also in some other characters, which will be described in the Appendix.

It is found in Ceylon and Pegu, of an octahedral form. Small crystals, from one to two grains, are very common, but stones of three carats and upwards are rare, and may be considered nearly of equal value with the oriental ruby.

BALAIS RUBY.

This is a pale variety of the spinelle; it varies in color from light red to yellowish red. It probably derives its name from some supposed locality, or from some peculiar earth, in which it may have occurred.

The Balais possesses considerable beauty, and though not so rare as the spinelle, it is by no means common. It is much admired for its agreeable tinge of color, and, when pure and perfect, sells for a high price, but considerably less than the other distinguished stones of this class.

SECT. IV.

On the Emerald and Aquamarine.

In public estimation, the Emerald ranks next to the Ruby. It is distinguished from all other gems by its color, which is a pure unmixed green, which varies in intensity from the palest possible tinge, to a full and pure body of color, than which nothing can be more beautiful. After beholding the dazzling splendor of the preceding gems, exquisite as they are in beauty and brilliancy, with what quiet pleasure does the sight turn to, and dwell upon the refreshing green of the emerald, calling up in the mind the full verdure of spring, with all the delightful associations connected with the youth of the year, the spring of life!

It appears from Pliny, that the true emerald was certainly known to the ancients, although many other stones, having a green color, were popularly confounded with that gem.

For the last two centuries and more, the only country known to yield Emeralds is Peru, where they occur in Santa Fé, and in the Valley of Tunca. Several large stones have appeared in Europe: about two years ago I cut one, exceeding two ounces in weight, for the Emperor of Morocco, but it was full of imperfections. The largest specimen known is an hexagonal crystal, nearly six inches long, and above two in diameter.

This gem, however small, is so rarely seen perfect, that "an Emerald without a flaw" has passed into a proverb. A fine stone of four carats may be valued at £40 or £50, or even more if very pure. Inferior stones of one or

two carats, are sold at from forty to seventy shillings per carat; and if smaller and defective, at ten or fifteen shillings per carat.

THE emerald is so highly esteemed in Europe, that it merits the best workmanship. It ought to be cut in planes or steps, larger or smaller, according to the intensity of its color, with a low bizel, and large table, and set on black. With this work it appears to the greatest advantage, especially if also surrounded by brilliants, the lustre of which contrasts agreeably with the softened hue of the gem.

FINE emeralds are rare, and in such demand, that a particular suit has been known to have passed into the possession of a series of purchasers, and to have made the tour of Europe in the course of half a century.

THE AQUAMARINE

Is, as its name implies, a stone of a sea green color, of different shades; sometimes it is greenish yellow, bluish green, and greenish blue. In hardnes it is inferior to the blue topaz, which some varieties resemble, but they may be distinguished by not possessing electricity. The finest stones are from Ceylon and Brazil.

This substance was formerly, and indeed only a few years ago, of considerable value, but it has been found in such abundance in Brazil, Siberia, and latterly in India, from whence vast quantities have been imported, as scarcely to allow it to retain its former rank.

Those only which are of a good color and sufficient depth are manufactured; they have

a pretty, lively effect, if in good proportion and well polished. Large stones from one to three or four ounces, are not uncommon, but from their bulk are only in request as specimens for the cabinet*; smaller stones, suitable for necklaces, may be bought at low prices, within the reach of every description of purchasers: ring stones may be had at a few shillings each, and larger for brooches or seals from £1 to £5, and often lower. They appear to the greatest advantage when proportioned with a high bizel, table not large, and full of work.

AQUAMARINES of inferior quality are generally offered for sale in lots, at lower prices than they would have cost in cutting a few years ago.

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* His Excellency Lord Strangford, on his return from Brazil, presented his Majesty with one of the finest hitherto seen.

SECT. V.

Yellow, Red, Blue, and White Topaz.*

In speaking of the Topaz, a gem of a beautiful yellow color is always understood; it is wine yellow of different degrees of intensity; and the fuller and deeper the tinge, the more the stone is esteemed. In hardness it yields to the spinelle.

There are few gems more universal favorites than the yellow Topaz when perfect: the rich warm tone of its color, the vivacity of its lustre, (which it retains even by the side of the diamond), and its large size compared with many others, are characters which deservedly

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* All the varieties have the same hardness and specific gravity.

entitle it to distinction; it bears accordingly a high price when of good quality.

It is chiefly employed for necklaces, ear-drops, bracelets, &c. in suit. No little skill and taste are required in cutting and duly proportioning this gem; the table should be perfectly symmetrical, and not too large, the bizel of sufficient depth, and the collet-side should be formed in delicate steps*. It works easily on the mill, and the lapidaries are in general tolerably well acquainted with it; yet it is uncommon to meet with one well cut.

The yellow topaz varies in price according to its beauty and perfection. A superlatively fine stone, perfect in color and workmanship, sufficiently large for an armlet, or any other

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* See plate of colored stones.

ornament, and weighing nearly eighty carats was sold for £100.

TOPAZES have become more common since our intercourse with Brazil, consequently they are less in demand, and lower in price. A fine stone of sixty carats may be purchased at from £20 to £35; and smaller, calculated for ring stones, at from £2 to £5: but it is not usual to sell them by weight.

THE PINK TOPAZ.

THE pink topaz is made from the yellow, which, when of intense color, is put into the bowl of a tobacco-pipe or small crucible, covered with ashes or sand: on the application of a low degree of heat, it changes its color from a yellow to a beautiful pink*. This is performed

* It possesses this property of changing color by heat

with little hazard, and if the color produced happens to be fine, the price is much augmented*.

THE RED TOPAZ.

This beautiful gem, which very seldom occurs naturally, is of a fine crimson color, tinged with a rich brown; it is extremely rare, and generally taken to be a variety of ruby, for which I have seen it offered for sale. Its price, from its scarcity, is quite capricious; it has an exquisite pleasing color, very different from the glare of the artificial pink topaz.

THE BLUE TOPAZ

Is also a beautiful gem, of a fine celestial blue color. It has occurred of considerable

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in common with the blue and yellow varieties of fluor; it also contains fluoric acid; which may be the cause of the change of color produced by heat.

* Many impositions are practised in forming pink topazes. See appendix.

magnitude; the finest specimen known I brought in the rough from Brazil; when cut and polished, it weighed above an ounce and a quarter. Smaller specimens are not uncommon, and, when light colored, are often taken for aquamarines, from which they may always be distinguished by their greater weight and hardness, &c.*

THE WHITE TOPAZ

Is familiarly called Minas Nova. It is a beautiful pellucid gem, and is used for bracelets, necklaces, &c. It possesses greater brilliancy than crystal, and from its hardness has been used to cover paste, &c.; and to form doublets.

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* This stone, and the yellow topaz before mentioned, now adorn the magnificent collection of Mr. Hope.

SECT. VI.

Of the Garnet.

THE color of the garnet varies from dark to light red or brown; the Syrian is considered the finest, and supposed to be the stone the ancients called the Carbuncle. It is always known by its peculiar color, and better by its great specific gravity. The finest varieties come from India, and some good specimens have been received from Greenland. When large, and free from flaws, they are worth from £2 to £5 or £6, and even more: but stones of this value are of rare occurrence, and always in demand.

FINE garnets are never out of fashion, as they can always be worn in mourning. A century ago, a suit of them was considered a

magnificent ornament for ladies of distinction. They are much worn in beads, both cut and plain.

Although in hardness the garnet is inferior to many of the gems before mentioned, still it receives a fine polish. On account of the intensity of its color, the table is made very large, and the facets are placed only on the bizel: the under side is frequently hollowed. Thus managed and set on shining foil, whether white or red, the garnet has deceived the purchaser, and has been sold for a better stone. Small garnets are often cut in rose.

SECT. VII.

Amethyst, Yellow Crystal, Rock Crystal, and Cat's Eye, Sard & Onyx, Opal, and Chrysoprase.

THESE substances belong to the same class, and differ chiefly in color and translucency.

THE color of the Amethyst, when perfect, resembles that of the violet or purple grape; but it not unfrequently happens, that the tinge is confined to one part of the stone only, while the other is left almost colorless. When it possesses a richness, clearness, and uniformity of hue, it is considered a gem of exquisite beauty; and as it occurs of considerable size, it is suited to all ornamental purposes.

In specific gravity and hardness, it bears no comparison with the oriental amethyst; it is also inferior in beauty and lustre; though I have often seen the common amethyst offered for sale as Oriental.

Brazil, Siberia, and Ceylon, produce very fine amethysts: they are found in rolled pieces in the alluvial soil, and finely crystallized in fissures of the rock. From the first of these localities, they have lately been imported in such quantities, as considerably to diminish their value: but, as they are the only colored stones, except garnets, that are worn with mourning, they still retain, when perfect, a distinguished rank among the precious gems.

The present price of inferior light colored stones, in the rough state, is about twenty shillings per pound, whilst those of good quality sell at ten or twelve shillings per ounce. Ame-

thysts calculated for brooches or seals, may be purchased at from fifteen shillings to two or three guineas each, for which, ten years ago, treble that sum would have been given.

THE amethyst shews to the greatest advantage when cut in steps, with double work upon the bizel; and the table and facets proportioned according to the intensity of the color. A perfect stone, when turned out of hand by a good workman, is a beautiful gem; it contrasts well with fine gold setting, and when surrounded with brilliants has a rich and splendid effect, but alone it loses much of its beauty by candle-light.

YELLOW CRYSTAL—CAIRNGORHM

Is of a beautiful yellow color, and of different shades, from deep to light yellow; also smoky and brown. It is used in various ornaments,

as necklaces, &c. but more generally in seals and brooches. Stones sufficiently large for this purpose, may be purchased at from five to ten or fifteen shillings each, and inferior for considerably less.

This substance has also been lately imported in large quantities from Brazil, which has so overstocked the market, that it is now selling at from fifteen shillings to two guineas per pound; whereas a few years ago it sold for three guineas per ounce: it is a beautiful stone, and will most likely become more valuable.—It is often set on foil, and sold for topaz, which it much resembles, but is less brilliant.

ROCK-CRYSTAL

Is a transparent substance proverbially clear. It occurs massive and crystallized, filling veins and crevices of rocks; also in rolled pieces in

the alluvium, and may be said to be generally distributed in all parts of the world. Small pebbles of crystal are often collected in the vicinity of London, as Bagshot, &c. which, on account of their cutting glass, and shining when polished, are called diamonds.—We have also Irish and Cornish diamonds belonging to the same class.

CRYSTAL receives a good polish, and is worked into an immense variety of forms; it is much used in jewellery, and commonly set on foil. Larger pieces are cut for the glasses of spectacles, hence called Pebble Spectacles. It is a substance in very general demand, and sells at from two shillings to ten shillings per pound.

THE CAT'S EYE

Is considered to be a variety of crystal, enveloping amianthus.

It is a common substance in Ceylon, from whence great quantities are annually received. It presents a peculiar luminous appearance when held in a strong light, resembling the eye of the animal from which it is named. Its color is generally light grey, yellowish, or reddish brown: a variety, of rare occurrence, is dark green, which exhibits more strongly and in greater perfection the same characters, and is much more valuable and highly prized.

Fine specimens of this stone are held in high veneration by the Cinglese. They are generally used for ring stones, and cut hemispherically.

SARD OR SARDOINE AND ONYX

Are terms not very distinctly understood; they are frequently confounded by writers on mineralogy, and still more so by lapidaries.

THE sard or sardoine* is considered to be a beautiful variety of chalcedony, and, when perfect, of one uniform tone of color, which is yellowish brown, or reddish brown, of lighter or darker tints, sometimes approaching black; it is more or less translucent when held between the eye and a strong light. When it exhibits angular lines of lighter colors, it is called Oriental Agate. It is generally found in the alluvial soil, and has often been met with in searching for gold and diamonds. It also occurs stalactitic and forming geodes.

THE ancients selected this substance, and the following variety, to engrave upon, no doubt from its possessing two peculiar and necessary qualities, namely hardness and tenacity, by which it is capable of receiving the

* The Sard or Sardoine owes its derivation to Sardis, a city of Minor Asia, where a peculiarly fine variety of chalcedony and agate is occasionally found.

finest touch or stroke of the tool without chipping, and shewing the art of the engraver to the highest perfection.

Any stone exhibiting layers of two or more colors, strongly contrasted, is called Onyx*: as banded jasper, chalcedony, &c. but more particularly the latter, when it is marked with white, and stratified with opaque and translucent lines. But the oriental onyx is considered a substance consisting of two or more layers or bands of distinct and different colors. A sard or sardoine, having a layer of white upon it, would be called an Onyx; and according to the number of layers, it would be distinguished as an onyx with three or more

* This stone derives its name from the resemblance which some varieties bear to the marks on the finger nail, and has been extended to all stones having a banded appearance.

bands: some of the antique engravings are upon onyxes of four bands.

THE PRECIOUS OPAL.

The color of the opal is white or pearl grey, and when held between the eye and the light is pale red, or wine yellow, with a milky translucency. By reflected light it exhibits, as its position is varied, elegant, and most beautiful iridescent colors, particularly emerald green, golden yellow, flame and fire red, violet purple, and celestial blue, so beautifully blended, and so fascinating, as to captivate the admirer. When the color is arranged in small spangles, it takes the name of the Harlequin Opal.—Sometimes it exhibits only one of the above colors, and of these the most esteemed are the vivid emerald green, and the orange yellow. When the stone possesses the latter of these colors, it is called the Golden Opal.

The precious opal is not quite so hard as rock crystal; it is frequently full of flaws, which greatly contributes to its beauty, as the vivid iridescent colors which it displays are occasioned by the reflection and refraction of light, which is decomposed at these fissures. It is never cut in facets, but always hemispherical. It is generally small, rarely so large as an almond or hazel nut, though I have seen some specimens the size of a small walnut, for which several hundred pounds were demanded. At present, a pretty opal may be bought at from one to three, or five guineas, sufficiently large for a pin, or ring stone. It requires great care and judgment in the cutting, as it is fragile, and easily spoiled.

The opal in all ages has been highly esteemed; the history of the Roman senator, who preferred death rather than give up his opal ring to the emperor Nero, is familiar to

every one. Among the Eastern nations the opal ranks higher than in Europe.

A SPURIOUS substance is sometimes sold for black and green opal, and is often set in jewellery; it ocurs of the size of a small almond, but more commonly not larger than a lentil or pea. This *precious gem* is nothing more than the cartilage of the hinge of a large shell. Glass, and even scoria, having an iridescent appearance, have also often been sold for opal*.

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* See Appendix.

THE CHRYSOPRASE

Is of a cloudy pale green color, and has an agreeable appearance: it is translucent, and shews to advantage by candle-light, more particularly if surrounded by small brilliants.

A CHRYSOPRASE of fine quality, and sufficiently large for a brooch or a seal, is worth from two to four or five guineas. It does not admit of being cut with facets, except round the bizel, which should be low, and the under side rounded. Inferior stones are common, and very low priced.

CARNELIANS are often extremely beautiful, and deservedly much esteemed, as are varieties of fine mocha stones, agates, and jaspers, whose peculiar characters are strikingly attractive. They are, generally speaking, the most common ornaments set in jewellery, but are not ranked in the class of precious stones.

SECT. VIII.

On the Peridot or Chrysolite.

THE peridot, or common chrysolite, is of an olive green color, of more or less intensity. It comes from the Levant, and is commonly found imbedded in lava. Although deficient in hardness and brilliancy, it is, on account of its agreeable color, not unfrequently worked up into necklaces and other ornaments: but owing to its being less hard than crystal, or scarcely harder than glass, it is but little in request.

THE tools the lapidary commonly uses, are not fit to polish the peridot; it should be transferred to the glass cutter, who will give

it the finest lustre it is capable of receiving: or the lapidary should use glass-cutters' tools, and polish with putty.

WHEN cut in steps, and formed in nice proportion, it will appear to the greatest advantage.

SECT IX.

On the Turquois.

THE color of the Turquois is beautiful celestial blue, which migrates into pale blue, and is sometimes tinged with green. It is destitute of that lustre which distinguishes most of the precious stones; it is also opaque, and does not admit of a very high polish; there is, therefore, nothing but its very agreeable hue which can recommend it to the notice of the jeweller. The latter character it possesses in no inconsiderable degree, and retains it unimpaired by candle-light. It has always been fashionable; and although great quantities have been imported, so as to render small stones extremely cheap, yet it has continued to be in considerable demand.

THE finest variety is called *Turquois Vieille Roche*, its texture is uniform and compact. This gem is highly valued in Persia and other Mahometan states, and on that account the most beautiful stones are seldom sent to Europe.

IT is doubtful whether the substance termed *Turquois Nouvelle Roche* is a real Turquois: it is generally supposed to be a fossil bone, colored by Phosphate of Iron; it frequently exhibits evident marks of organization*.

THE turquois is much worn in necklaces, and in every part of ornamental jewellery, from the size of a pin's head, to that of an almond: it contrasts beautifully with brilliants, or pearls set in fine gold, and appears to most advantage when cut spheroidal.

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* This supposition is strengthened by its chemical characters, the Nouvelle Roche always effervescing in acid, which has no effect on the turquois.

THE imitations of this gem are feebly translucent, and lose their beautiful tone of color by candle-light. They are also much inferior in hardness, and have a greater specific gravity.

SECT. X.

Zircon—Hyacinth and Jargoon.

THE Hyacinth is of an orange red color, and, when free from defects, is a beautiful and brilliant stone. Small specimens are common in Ceylon, where they are cut and polished; they rarely exceed the size of a bean, but they have occurred large enough for brooch stones. As they are generally full of flaws, they are not often employed in jewellery.

THE JARGOON,

THOUGH differing in color, is of the same class with the preceding. It is a transparent stone, greatly resembling colored crystal, but when polished, it has considerably more lustre.

A CENTURY ago this gem was considered to be a variety of diamond; it was usually set in rings, buckles, and around stones of little value: at present it is seldom used in jewellery, and therefore bears but a very low price.

TOURMALINE.

THIS stone is remarkable for its electrical properties. It generally occurs in black and opaque crystals; but the precious varieties are translucent, and of a green, blue, or pink color; they are used for ring-stones, brooches, or seals. By heat or friction it becomes electric, and may be distinguished by this property, which it retains many hours.

MOON-STONE.

Is a beautiful translucent substance, of a bluish white color. When cut spheroidal, it reflects a strong light, which appears on the surface of the stone, agreeably contrasting with the pale celestial hue of the gem. It is used chiefly for ring-stones and ear-drops. Fine specimens were formerly sold at high prices; but the recent importations from Ceylon have considerably reduced their value.

SUN-STONE

Is a rich variety of aventurine, which reflects a bright flame-like color, when held in a strong light. It is a silicious substance, and owes its peculiar beauty to the arrangement of its particles, or the dispersion of minute specks of mica in ferruginous quartz. It is rare, and much valued by connoisseurs.

SECT. XI.

On cutting and polishing precious Stones.

THE cutting and polishing of precious stones forms the business of the lapidary, an art materially differing from that of the diamond cutter.

THE lapidary's apparatus* consists of a bench and several mills, adapted to the various operations he has to perform. They receive their motion from a wheel, which is turned with the left hand, by means of a crank. The mill used for cutting or rub-

* Portable lapidary's machines are so contrived, that they may be set on a parlour table.

bing down the stones, is a horizontal plate of soft lead*; its surface is supplied with wet emery powder, which becomes indented in it by the pressure of the stone.

WHEN a stone is to be polished, the lead mill is removed and replaced by one of pewter, which is first prepared by what is termed *hacking*. This operation is performed by holding the edge of a knife perpendicularly upon it, and turning the mill in contrary directions, until a rough surface is produced. Rotten-stone is then applied to it, with a little water, and the stone is held on the mill until it has received the polish required.

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* The oriental stones and chrysoberyl require to be cut on a brass mill, with diamond powder and oil instead of emery and water. They should also be polished on a copper mill with rotten-stone.

Soft stones, as Opals, Peridots, &c. are polished on mills covered with cloth, and oxide of tin is used with a little water, instead of rotten-stone.

Gems that require nicety in cutting, whether in steps or brilliant, should be given to an experienced workman. The operation is commenced by holding the stone between the fingers until it is rubbed down into the shape required, first forming the table, next the bizel and girdle, and lastly the collet-side. This done, the stone is cemented to a round stick, four or five inches in length. The ribs and facets are formed by holding the stick in an inclined position on the mill, and supporting the other end in a notch on the *gin-peg*: this instrument is an upright peg, fixed in the bench by the side of the mill, containing holes or notches, one above another, to receive the

end of the stick: thus the angle the facet makes with the girdle is greater or less, as the stick is inserted in a higher or lower notch. The peg not only tends to keep the hand steady, but is the cause of the facets being cut true, and always forming the same angle. In step cutting, it is particularly useful; otherwise it would be difficult to place the rows of steps parallel to each other.

To assist the lapidary, quadrants, angles, &c. have been formed with mathematical exactness, in which the stone is placed to be cut and polished; but our workmen have rejected their use, considering them only fit for novices, and depend wholly on tact and a well-practised eye.

The slitting of precious stones, which is a very important branch of the lapidary's busi-

ness, is performed by a horizontal mill of thin iron, properly hammered, on the edge of which diamond powder is placed, and pressed into it so as to form teeth. Some nicety is required in corning the mill. The best method is to put half a grain of diamond powder in a watch glass, with a few drops of oil, and, with the point of a pen, to place a minute quantity on a small circular instrument, called a *Gigger*, which is then held against the edge of the mill, while it is gently turned round. By this means the diamond powder is equally distributed. Practical lapidaries usually put a small quantity of powder on a block of steel or a smooth stone, with a drop of oil, and rub it with a muller to separate the particles; they then apply it to the mill with the finger, and set it in the edge by holding a piece of glass against it, at the same time turning the mill round gently.

Oil must be copiously supplied during the operation of slitting; and if the mill be properly corned, it may be worked a whole day without requiring any additional diamond powder. Lapidaries use Oil of Brick, on account of its great fluidity; but as its smell is extremely disagreeable, warm olive oil may be substituted.

THE END.

APPENDIX.

APPENDIX.

IMITATIONS OF COLORED STONES.

THE pink variety of the Topaz being considered the most valuable and beautiful, many impositions have been practised in making imitations of it. The most common is to form a doublet of a white topaz, and to introduce a little color between the pieces. When this manufactured gem is finely cut and close set, it bears a strong resemblance to that which it is intended to imitate; nor will the measures generally adopted to detect fraud in other stones avail here, as, being a topaz, it is inferior neither in hardness nor in lustre to the real gem. If the jewel is close set, and the table very low, this imposition can only be discovered by drawing the stone from its setting, when it will appear perfectly limpid, except in the part where the color is introduced: but if the table is high the fraud may be detected by holding the jewel horizontally between the eye and the light, as the part exposed will then appear perfectly diaphanous.

Similar impositions are practised with regard to the emerald, by covering green glass with a plate of white topaz. This, as well as all other imitations of colored stones set in jewellery, formed by means of the white topaz, may be discovered by the methods above described.

Paste, in which the color is uniform, made to imitate precious stones, may be detected by its being easily abraded by the file, which has no effect upon the real gem.

ON THE DISTINCTIVE CHARACTERS OF THE SPINELLE RUBY.

THE Spinelle Ruby differs from the Oriental in two very decided characters: its color and its crystalline form.

THE color of the Spinelle is, as we have already stated, a full carmine red, but it never presents that rich mellow tinge, which attends the oriental. The inferior specimens vary considerably in intensity of color, but do not exhibit the angular lines and opalescent appearance, which are so generally observed in inferior oriental rubies.

THE Spinelle usually occurs in well defined crystals, and frequently presenting the primitive form, a regular octahedron; which is sometimes truncated on the edges and angles. The oriental, on the contrary, is very rarely found crystallized, but generally in rounded fragments.

THE inferior hardness and lower specific gravity of the Spinelle, are also very decided marks of distinction, and are easily applicable to the discriminating the two gems when cut and polished.

THE Spinelle receives its color from the oxide of chrome, and the oriental ruby from oxide of iron.

FROM the red topaz, the Spinelle may be distinguished by its very feeble electricity; and from the garnet by its superior hardness and lower specific gravity.

THE OPAL.

MANY impositions have been practised in forming imitations, or enhancing the effect, of the Opal. The first I shall describe (if indeed that can be called an imposition, which, like the shades of a picture, tends to display to greater advantage its rich and glowing colors) is effected by warming the stone, and immersing it in oil or grease, which is afterwards burnt off. The rents which had absorbed the grease, by this means become dark, and agreeably contrast with the beautiful iridescence of the stone, which now assumes the name of the black or green opal.

A VARIETY of opal has lately been imported from Mexico, in considerable quantities. It is pellucid and so soft that it may be scratched by the knife. Some specimens have brilliant patches dispersed in an earthy substance; these appear to great advantage after having been submitted to the process before described.

GLASS that has been long exposed to the action of the atmosphere, especially in stagnant waters, often becomes beautifully opalescent, and presents a richness of color equal to that of the gem itself. The cartilage of the hinge of the Chama Gigas, after desiccation, bears also a striking resemblance to the most beautiful varieties of opal, for which, as well as the preceding, it has sometimes been sold. These imitations may generally be detected by their inferiority in hardness.

TABLE of the Specific Gravity, Primitive Form, Electricity, and Refraction of Gems.

Arranged according to their relative hardness.

NAMES OF GEMS.	SP. GR.	PRIMITIVE FORM.	ELECTRICITY BY FRICTION.	REFRACTION.
Diamond	3.5.	Octahedron	Feebly, 10 minutes. .	Slightly double . . . .
Sapphire	4. to 4.2.	Slightly acute Rhomb	Strongly†.	Idem . . . . .
Chrysoberyl	3.8.	Parallelopipedon . . .	Feebly	Idem . . . . .
Spinelle*.	3.7.	Octahedron	Feebly	Single . . . . .
Emerald	2.8.	Hexagonal Prism . .	Feebly	Double . . . . .
Topaz	3.5.	Rhomboidal Prism . .	Very strongly‡ . . .	Double . . . . .
Aquamarine	2.6.	Hexagonal Prism . .	Feebly	Slightly double . . . .
Hyacinth & Zircon . .	4.4.	Parallelopipedon . . .	Strongly	Double, in a high degree
Tourmaline	3.2.	Obtuse Rhomb	Strongly	Double . . . . .
Garnet.	4. to 4.4.	Rhombl. Dodecaedron	Very strongly ‖ . . .	Single . . . . .
Rock Crystal, Amethyst, Yellow Crystal, &c.	2.5. to 2.7.	Obtuse Rhomb	Feebly	Slightly double . . . .
Opal	2. to 2.3.			
Peridot	3.3.	Parallelopipedon . . .	Feebly	Double . . . . .
Turquois.	2.4.			

* The Spinelle and Chrysoberyl are equal in hardness.

† Particularly the white variety.

‡ Particularly the white variety from Brazil, which will continue many hours.

‖ Sometimes attracts the magnetic needle.