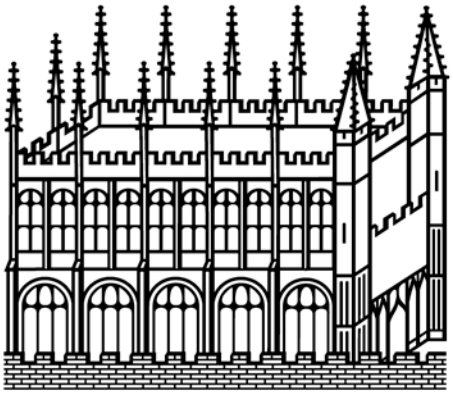
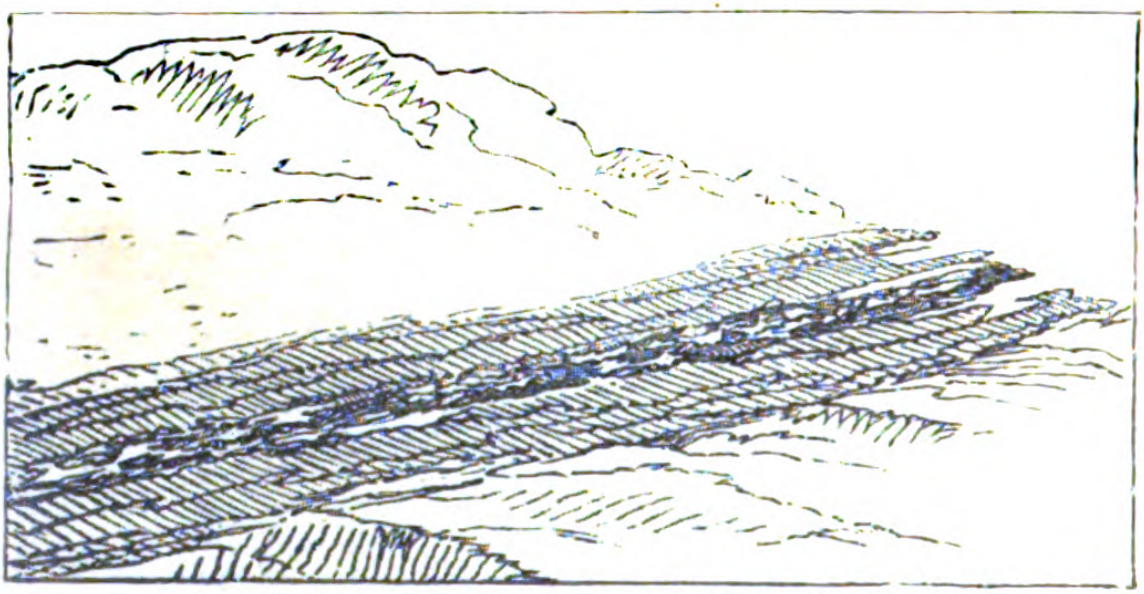
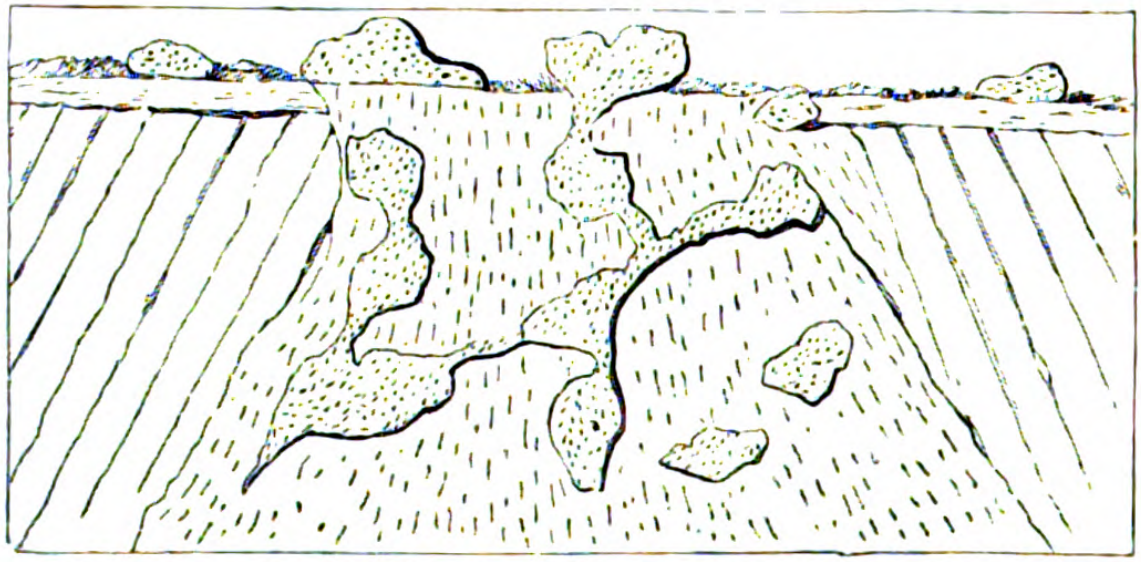
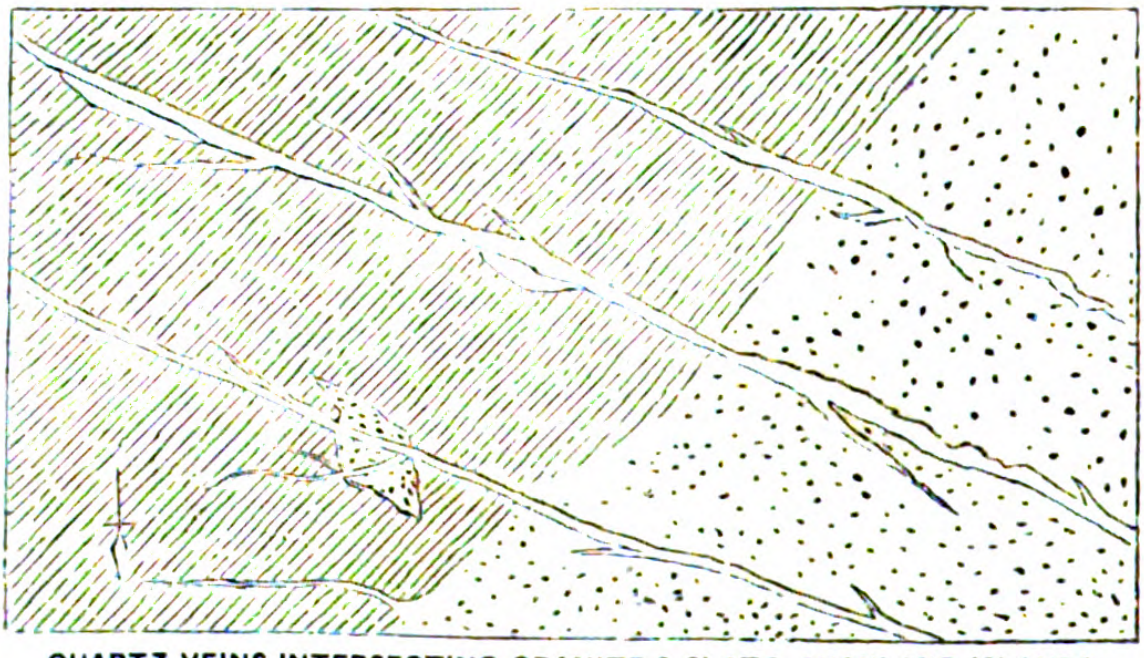




VEIN OF QUARTZ IN MARIPOSA DISTRICT, CALIFORNIA.



STRUCTURAL FORMATION OF GOLD-BEARING ROCKS, OPHIR, N.S.W.



QUARTZ VEINS INTERSECTING GRANITE & SLATE, AUCKLAND ISLANDS.

A HISTORY OF GOLD

AS

A COMMODITY AND AS A MEASURE OF VALUE.

Its Fluctuations both in Ancient and Modern Times,

WITH

AN ESTIMATE OF THE PROBABLE SUPPLIES FROM CALIFORNIA AND AUSTRALIA.

By JAMES WARD,

AUTHOR OF "THE WORLD IN ITS WORKSHOPS," "THE TRUE ACTION OF A PURELY METALLIC CURRENCY," ETC., ETC.

WITH A COLOURED GEOLOGICAL MAP.

LONDON:

WILLIAM S. ORR AND CO., AMEN CORNER.

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1852.

TO

JOHN MASTERMAN, ESQ., M.P. & D.C.L.,

This little Work

IS RESPECTFULLY DEDICATED,

AS A RECOGNITION OF THE HIGH QUALITY OF CHARACTER

WHICH IT IS POSSIBLE TO ATTAIN

BY HONESTY OF PURPOSE,

SOUNDNESS OF JUDGMENT, AND PRUDENCE OF ACTION.

THE AUTHOR.

CONTENTS.

A HISTORY OF GOLD

AS A COMMODITY AND AS A MEASURE OF VALUE.

CHAPTER I.

PRELIMINARY REMARKS.

WHENEVER any incident occurs that holds out the prospect of immediate gain to the community, it is seldom, if ever, neglected; and the rarer the incident, the more broadly it deviates in its attendant circumstances from the ordinary course of things, the more eagerly is it watched, and the greater amount of excitement is it likely to create.

The recent discovery of gold in two distinct quarters of the globe, and in more than ordinary abundance in each, is just such an incident as we allude to, and is having precisely the effect as might be predicated of it.

The circumstance of being able to pick up gold like common dirt is, in itself, of so extraordinary a nature, so completely opposed to all our experience, that its first announcement was received with something like a doubting reservation, and had it not been attested by a goodly array of facts, the public were half-disposed to treat it rather as an airy unreality of romance than one of the hard, naked, and practical doings of this material world. Its truth, however, is placed beyond the reach of controversy, and truth, under these conditions especially, is entitled to the greatest deference, greater than we pay to mere fiction.

Herera, the Spanish historian, relates that those who had the good fortune to return from a voyage to the Indies, as Peru and Mexico were then called, amazed their countrymen with accounts of the gold which they found in those strange countries—of the rivers in whose rich beds the precious metal was picked up in abundance—of the indifference of the Indians to retain it—and of their willingness to exchange it for the merest toys and trinkets. As the Spaniards listened to these tales, says the historian, their eyes would brighten up, and their mouths be kept agape, for the attendant circumstances were so strange, so wondrous, and so really incredible; but when the gold was spread out before them in glistening array—in lumps, flakes, and grains,—their feelings knew no bounds, and their excitement could scarcely be repressed.

"When Columbus landed upon Hispaniola," says another authority,* "the Indians gladly gave him their gold for whistles, little knives, small looking-glasses, and other inconsiderable trifles. They valued the precious metal no more than dirt, as they exchanged slaves for commodities, having no knowledge of any coin."

These circumstances occurred some three hundred and fifty years ago, when the thoughts of mankind, or at least their actions, were limited to the comparatively narrow space of Europe and the adjacent continents, for the new world had then but just dawned upon the horizon of intelligence, so that the means of reaching the "gold-diggings" of that day must have been exceedingly restricted, and only available to those whom authority chanced to direct, or powerful private interest to patronize. A voyage to the West Indies must then have been a rare event in an individual's life, and confined to a certain privileged few; "for the great ships," says Herera, "only went to sea once a-year, and always sailed out of the port of Seville, where a vast multitude of people saw them depart, many thinking never to see them again."

A bold and reckless Hidalgo, for instance, who wished perchance to repair his shattered fortune, accompanied with a few followers in a similar condition; some soldiers, drafted from

* M. Perier. General History of Voyages and Travels. Paris, 1708.

different quarters, either by special favour, or deserving of punishment, but mostly the latter; a picked crew of Genoese sailors, the most expert seamen of that day; and a Catholic priest or so by way of salting up the whole, were the ordinary concomitants of the adventurous crews who first visited the new world in search of its tempting treasures; and if any of these daring voyagers had the good fortune to return, if they escaped the dangers of the sea, from their ignorance of navigation, the fierce encounters of the Indians, and the rough hand and sharp eye of the pirate on their homeward voyage, they were naturally considered as the *raræ aves* of the nation, and treated with the respect which was due to their noble daring. Under these circumstances it is clear that the few, the circumscribed few, could alone embrace the opportunity of gathering the rich treasures which the course of events had so temptingly spread out; and however intense may have been the excitement on its becoming publicly known, the intensity was confined to a comparatively narrow range, for the people at large knew little about the treasures, and cared still less, seeing that they had no chance of obtaining even a portion of it. Moreover, it is not in the nature of things that mankind should sigh after objects which they never could hope to obtain, or waste their energies upon that which is clearly beyond their reach. Like the fox in the fable, the mass of the people are disposed to cry "sour, sour," whenever the grapes are hung too high, and endeavour to forget them as quickly as possible.

The bulk of the Spaniards, therefore, of the sixteenth century, had but few opportunities of availing themselves of the rich treasures of the newly-discovered world, and could only participate in the crumbs, as it were, which fell from the lucky adventurer's table. These adventurers, however, expended their easily-acquired wealth with singular, and, in some instances, with senseless prodigality, so that the mere circumstance of supplying their ordinary wants, not to mention their pleasures and pastimes, must have diffused a considerable portion of that wealth amongst the mass of the people. The old adage holds good even in this instance, "easy comes, easy goes;" and if we may credit certain historical statements as to the effect

which this sudden influx of wealth had upon the general condition of the people, and upon the interest of the nation at large —if we may rely upon what is commonly called the philosophy of history, or rather upon the practical deductions which the science of political economy enables us to draw at the present day—it is extremely doubtful whether it was beneficial or not. But we must reserve this point for another place.

The recent, and, if so it may be termed, second discovery of the precious metals in great abundance, has one or two features in common with those which were presented by the first, although the broad and general phenomena of the latter are essentially different. We have, for example, the unchanging character of the semi-savage native, with his utter disregard of that which his more advanced and more civilized brother so dearly prizes; and we have, likewise, the precious metals occuring in great abundance, and in precisely the same conditions, so at least it may be practically inferred. These are two important facts which observation and the light of science have clearly established. We have, moreover, the daring, the spirit of enterprise, the adventurous courage, and, we must add, the reckless disregard of human life, which characterized the bold discoverers of the sixteenth century. Here, however, the parallel ceases, and, as we continue the lines of comparison, the divergence from the equidistant becomes greater and greater, until there is no possible connection between them. For instance, the Dons and Hidalgos of this age are scarcely seen upon the stage; and the picked soldiers and the choice crews; the priests and the royal patents; the archbishops and bishops sprinkling holy water upon the vessels, and bestowing their blessings upon the captains and crews; kings, princes, and nobles; cavaliers and fair ladies of the highest rank and birth, with a phalanx of supporters; besides a multitude of spectators to look in wonder at the exclusive few who boldly ventured to the "diggings" of that day—where are all these? The reader of this little work must endeavour to answer the question.

But what have we instead of this showy array? Look at the picture as it really exists; there is no difficulty in discerning its composition. Take the first compartment of the

tableau. On the banks of the Sacramento, at the western base of the Sierra Nevada, you may perceive a strange and motley group, a mixture of all nations, and speaking all tongues, yet all animated with one desire—the search for gold—which they pursue with the utmost avidity. The love of gain, the master passion of the human heart, has drawn that heterogeneous assemblage there, and what they earn they will enjoy, each according to his desires, and uncontrolled by the dictation of his neighbour, apart from robbery and murder, which, by the hypothesis, are excluded from the comparison. Instead of being led by some noble and needy adventurer, as of old, who

> "Here and there,
> Shark'd up a list of landless resolutes,
> For food and diet, to an enterprise
> That had a stomach in't,"

the gold-hunters of California have gone there of their own accord, and have braved all these dangers to accomplish their own ends. Over seas and over continents, through morasses and deserts, traversing the highest mountains, and fording the most dangerous and rapid rivers—they have endured all this, and would endure it again for the same purpose. They may be, for aught we know, the "landless resolutes" of all the world, but it is clear that they have been "shark'd up" to their present "enterprise" by their own free-will,—by the demon of avarice, if you like, or, as Virgil somewhat gloomily puts it, by the

> "Auri sacra fames;"

yet the *mortalia pectora* of these diggers are not the only tabernacles in which the "accursed thirst for gold" has taken up its exclusive abode. Be this as it may, the great fact stands out in bold relief that these adventurous miners are free agents, that their bodies and souls are not at the beck and nod of a comparatively selfish and domineering few,—which constitutes the difference of feature between the majority of those who picked up gold in the sixteenth century, and those who are picking it up at the present time. And this fact suggests many others, which are well deserving of a remark or so.

Instead of ships sailing out of port, with great pomp and

ceremony, once or twice in a year, and from a single place, we have them in almost countless numbers from every quarter of the globe, and sailing to and fro their thousands of miles as uninterruptedly as the stately barges of Seville were wont formerly to sail down the smooth waters of the Guadalquiver. The term "danger" even is nearly obliterated from the vocabulary of navigation, and has little beyond an economical meaning, for the intelligence of man has enabled him as it were to "grasp the ocean in his span," or, to speak in more sober and befitting phrase, has taught him how to reduce the highways across the Atlantic and Pacific to the simple condition of a turn-pike road. And this multitude of ships, the shadow of whose sails darkens every water, is another feature which distinguishes the gold epoch of this age from that of the sixteenth century, for thousands now can be transported to scenes and localities where their labour may be made available, and their industry exercised, for their own advantage, and for the creation of an honest and healthy independence, while units before had scarcely the same chance. The fitting out of a single ship in these days, the whole cost of her structure, will scarcely amount to as much as an embroidered velvet mantle of a sixteenth-century Hidalgo, nor near so much as many of the latter were in the habit of squandering on the *Plaza di Toro* at a single bull-fight. Then there is the wealth, the comparatively useless wealth, of the grandees of Spain, which was principally drawn from the rich mines of the Indies —how was that employed? "Upon the death of the Duc d'Albuquerque," says Bassompierre,* "it took six weeks to complete the schedule of his vessels of gold and silver, working two hours each day. There were 1400 dozen of gold plates and dishes, and forty steps of solid silver to serve as ladders, by which he could ascend to the top of his lofty *buffets*. When they told me of this opulence I thought they were quizzing me, but when I inquired of Don Antonio de Toledo, son of the Duc d'Albe, he assured me it was true, and that his father, who did not consider himself rich in plate, had six hundred dozen of dishes of gold, and eight hundred of silver." A single

* Relation du Voyage d'Espagne fait en 1679.

service of such valuable plate would more than defray the cost of the fleet of merchant ships which are almost weekly transporting emigrants to the modern gold-diggings; it would even secure a free passage for the thousands who are crowding their decks, and send them merrily onwards to their destination, whither the hope of gain and the love of independence have temptingly allured them.

We simply cite these circumstances to point the moral and industrial features which distinguish these times in contradistinction to those we have drawn attention to, and not from a desire to indulge in any disparagement of social distinctions, for which we are somewhat ardent sticklers. The few who had the means of acquiring wealth in the sixteenth century, doubtless acted upon the same conscientious principles as those who acquire wealth in the present day, but in the use of that wealth —in its application to reproductive purposes—they were much behind the present age. This is the feature we are desirous of pointing out, and an important feature it is to the toiling million, who are by no means slow to discern its advantage.

Let us now examine another compartment of the picture, and, all things considered, the most interesting of the two. Just transport yourself, reader, from the foot of the Sierra Nevada to that of the Blue Mountains, from the banks of the Sacramento to that of the Macquarrie, and you will perceive a similar scene of activity. Granite rocks, boulders, watercourses, creeks, sand, dry diggings and wet, cradles and washers of all sorts, with a multitude of beings, intently as those of California, in search of the precious metal. At the first blush the Australian group will appear as like that of California as one swarm of bees is like another, or as one rope of onions resembles its fellow; nevertheless, upon closer examination, you will soon perceive a difference, which is well worth noting. Here you have more quietude amongst the diggers,—indicative of a higher social discipline than you can observe in the Californian group,—and a marked absence of the predominant feature of the latter, that reckless, rollicking, devil-may-care, desperado character, yet withal spirited, bold, and picturesque, but with a dash too deep of truly callous wicked-

ness. There are, probably, as many noisy, drinking, tear-throats among the Australian diggers as elsewhere, but you cannot meet with that Mephistopheles-mixture of man and fiend, that *blazéd* piece of humanity whom the vices of the world have sear-hardened, who can put on the guise of honesty with the most deceptive ease, or throw it aside if aping its opposite quality will better answer his end; in short, that concentration of self which is ever ready either to caress or to crush its victim, according to the balance of advantages. There certainly is an absence of that interesting colouring in the Australian portion of the *tableau* when compared to that of the Californian.

"But these Australian diggers," you will say, "have no such excuse as those of California could make; they neglect the treasure which lies, as it were, immediately beneath their feet, to hunt after that which tempts the eye at a distance. It is the old story of the tortoise and the hare, only told in another form. The steady going pace of the tortoise ultimately beat the more rapid but non-sustaining movements of the hare. Here you have repeated the craving desire of the many to gratify their wishes without the necessity of labouring for the means, or, in other terms, the hop-step-and-jump-process of procuring a competence, in contradistinction to the old-fashioned and healthy-toned habit of acquiring it by steadily-directed industry." Granted. But the avidity to obtain gold at once and directly, in preference to acquire it indirectly by industrial pursuits, is no new feature, nor is it exclusively confined to any one class of men. It has been a common error in all ages to regard the representative of the value of things as more important than the things themselves, and consequently to prefer the producing of gold and silver to all others. Hence the avidity for gold-digging and gold-mining; here that profit seems to be made at once which in other cases can only be hoped to be made after repeated industrial operations. Here seems to be opened at a single effort the sources of wealth, and it is natural in the present state of mind of the masses that such principles should obtain.

With every disadvantage, however, which can possibly be

enumerated of the gold discoveries of California and Australia, it is fair to assume that a balance of good will result from them. These discoveries have imparted to the public mind the precise impulse that was required. There was a congestion of population in more than one quarter of the globe that stood greatly in need of dispersion, ere the general body could enjoy a healthful exercise of its functions. To be choked up in masses here,—to be thinly scattered there. Empty mouths and idle hands in this quarter of the globe,—a scarcity of hands and ample means to employ them, in order that those mouths might no longer remain empty, existing elsewhere. These disproportionate relations required adjusting, and the adjustment is about to take place, which must tend greatly to augment the interest and happiness of all. This, doubtless, is a step in the right direction; another link added to the great chain of progress, which all of us desire to see lengthened, however diversely our efforts may be directed to that purpose.

In these two communities, therefore, may be contemplated the *nuclei* of other great and rising sections of mankind, which, in the progress of time, will fulfill their destiny equally with those who have preceded them. The world never dies; but how its existence is perpetuated is beyond—far beyond—our limited capacity to comprehend. Nor shall we venture to intrude upon the domain of speculation, either as regards the mysterious agency of Providence in human affairs. * * *

"Shall winking tapers show the sun his light?"

* * * The finding a bit of shining metal in a mill-tail, simple though it appears, may be connected with the invisible chain whose links are destined to hold mankind in peaceful relation to each other—to make them as one family, as one race, among whom the fruits of industry shall attain their healthiest growth, and the enlightenment of mind its most radiant hue. This simple incident may prove the turning-point in the destiny of mankind. There were many difficulties in the way of human progress, ere the event to which we allude occurred, which sorely puzzled the brains of men, and which, to all appearance, were really insurmountable. There was the

Isthmus of Panama, for example, to cut through, which all knew would prove highly advantageous as a means of communication with the great world in the east, if once effected; and there was, likewise, the supply of labour to Australia, which presented such peculiar and anomalous features to the mother country, although the most thriving and wealthy of all her colonies.

We point to these two prominent difficulties, as many others hinged upon them; and how have we grappled with them? There has been no end of treasure wasted in search of a north-west passage, which, if discovered, would be of little comparative use for mercantile navigation; and, in making the search, we have probably doomed a body of brave and devoted adventurers to destruction, whose best energies, like those of many others, have been exerted to little or no purpose. As regards, however, the supply of labour to Australia, even the omnipotent power of Parliament proved itself inadequate to that task, although it had the exciting impulse of well-filled unions, saucy paupers, highly-swollen poor-rates, peddling parochial politicians, and the high priests of political economy to urge it on, and to indicate the path it ought to take. Still, Parliament was powerless, if not paralyzed, and at length betrayed the usual symptoms of impotency.

We shall now conclude our preliminary observations, and state a little more in detail the immediate aim of this little book.

First—The Condition of Gold in its Natural State.

Second—The Method of Obtaining Gold, and its General Distribution.

Third—General Character of Gold—Variations in Value—Peculiar Affection for it among Mankind.

Fourth—Auckland Isles—Trip to the Gold Fields of California.

Fifth—Trip to the Gold Fields of Australia.

Sixth—Effects of the Influx of Gold upon the Standard of Value.

We have adopted the preceding order of arrangement, so that the reader may be furnished with a ready reference to

each compartment of the subject, and we venture to hope that such reference may be made with both interest and instruction.

CHAPTER II.

THE CONDITION OF GOLD IN ITS NATURAL STATE.

GOLD in its natural state is almost uniformly found under the same conditions. The researches of geology, in different quarters of the globe, have clearly established this fact. There is scarcely a difference of opinion amongst those who may be termed the lights of the science, and their views may be conveyed, with scarcely an exception, in the following formula:—

Gold, when traced to its original matrix, is found to occur chiefly in veins of quartz, in the form of lumps, threads, and flakes, or in grains mixed with sand in rivers. These veins are found in what geologists term the metamorphic series of rocks, which comprise granite, under certain conditions, porphyry, serpentine, gneiss, mica-schist, and other eruptive formations. "Experience," says a great authority,* "has shown that it is in the primary group only, including certain igneous rocks which are associated with it, that gold ore has ever been found in any large quantities—in quantities worthy of being worked. Wherever clay slates, old limestones, and greywacke sandstones, have been penetrated by greenstone, porphyry, syenite, granite, or serpentine, and were consequently in a more or less metamorphic or crystalline condition, these auriferous quartz-ore vein-stones must occur, containing gold ore diffused in grains, leaves, lumps, and irregular filaments. Every discovery in the auriferous regions of Siberia and America, as well as the workings in the old world in past times, confirm this view, and prove it to be a *geological constant*, that the azoic and palæozoic rocks, when metamorphosed, are the only *great* repositories of gold ore." If an objection can be raised

* Murchison.

against this able description of gold in its natural state, it is that of being somewhat too general, which we shall endeavour to show in the course of our remarks, premising that we venture to do so with extreme caution, and from a conviction that our observations will be received by its distinguished author in a proper light.

Another peculiarity of the condition of gold is also pointed out by the same authority, and is deserving of especial notice. "These veins are described as rising from beneath, because they are seen to cut through all the strata or beds of which the hills have been originally composed. Whether these great traversing vein-stones have had their metalliferous ores sublimed into them from beneath by heat, or agglomerated by galvanic action and slower processes (possibly by both), it is to the ascertained facts only that we now advert, and we do so in order that the reader should comprehend how the distribution of gold, in its original vein-stone or parent rock, differs from that of every other metal in the minute diffusion of its threads and particles, and their superficial range. Lodes of iron, copper, and argentiferous lead ores, when followed downwards, have in countless cases been found to become more and more productive; whilst *gold* has invariably proved to be much attenuated downwards, and in most instances to disappear in the veins at any considerable depth. An attention to this mining fact at once explains why the greatest quantities of gold-dust, and the largest lumps of gold should be constantly found in rubbish, gravel, sand, or clayey beds, which have resulted from the wearing down of those rocks, in the upper parts of which most of the gold was accumulated."*

The circumstance of gold being found in the beds of rivers, both in ancient and modern times, in much greater abundance than in natural veins, is fully accounted for in the preceding remarks. The more immediate cause, however, of the precious metal being thus separated, or disintegrated from the parent rock, is deserving of still further explanation. All rocks are more or less dissolved, or disintegrated, when within reach of the oxygen and carbonic acid of the atmosphere, and water

* Quarterly Review, Sep. 1850.

aided by heat. Some, it is true, appear to be nearly indestructible, and are practically so when kept dry, as appears from the integrity of certain sienites in the dry climate of Egypt, of which some ancient monuments still exist; but even these would suffer, if they were slightly covered with earth, and kept wet. Most of the rocks in the great mountain ranges are of the easily destructible kind, and it is mainly owing to this fact that ravines of denudation are so numerous on their flanks. Although quartz, in which gold is principally embedded, is not so liable to be acted upon by atmospheric agents as other rocks, which accounts for its projecting out in relief, or lying in masses over or below the outcrop of the vein, if it be on an inclined surface, still its disintegration is certain, and the tenacity of its component parts is gradually overcome. But as slate rocks appear to prevail in all gold-producing districts, and as the veins of quartz sometimes permeate the slates, which are among those most readily acted upon by the atmosphere, the gold is quickly released from its matrix. Even in summer these slates are undergoing almost continuous exfoliation, which soon reduces them to the minutest fragments, but in winter, when exposed to alternate frost and rain, their transformation is extremely rapid. Trap, porphyry, and other igneous rocks, with which quartz is frequently connected, also undergo a similar change, by the simple effect of the atmosphere. But the heavy rains, which periodically sweep down the mountain sides, have the greatest effect in producing the disintegration of these rocks. Hence the great area of diluvial drifts, the enormous boulders, the deep ravines, and the extraordinary denudations, which, more or less, are observable on the sides and in the valleys of all great mountain ranges. During these heavy rains the large boulders are driven furiously along the ravines, and lodged wherever the lessened velocity will permit them to remain; and the gold imbedded in the veins of the quartz becomes disintegrated, and, by its specific gravity, remains principally in the bottoms of the ravines. As these currents decrease in force, the heavier stony fragments are deposited, and in many instances cover the auriferous and other metallic substances; but the gravel and sand,

from their comparative lightness, sweep on and form the immense beds which are now seen at the base of the mountains, and the large deposits in the valleys.

It is, therefore, to the great *alluvion*, which consists of earth, sand, stones, gravel, and other matter, loosened from the rocks by atmospheric disintegration, and swept down by the heavy rains, that we must look for the largest supplies of gold. The great convulsions, also, which periodically occur in the mountain ranges, sometimes break down their sides, and deposit vast heaps of detritus with their mineral impregnations in the valleys immediately adjacent, and when the rivers flow through these deposits, the earthy portions are carried away, while the heavier, or metalliferous, either sink to the bottom or are scattered hither and thither, according to their specific gravity. Hence a lump of gold is occasionally found in a side creek, or in the bend of a river, just as accident, or its resisting weight, may determine, but generally far away from its parent rock. But the general condition of gold is in small particles; when found in these great drifts, and in a river of any length it is generally deposited much above its estuary. In several cases, where the upper sand of the river-bed shows no appearance of gold, it may be found in abundance below, especially where the coating of sand is thick, or the washing of the flood is deep. The deeper the gulley, in fact, the greater the chance of a deposit. The same cause which confines the gold deposits to the water-course, also accumulates it on certain spots. Every natural bar, for instance, which arrests the water, must likewise arrest the gold, and the latter will be generally found there, or just above it, in more than ordinary abundance. The mountain freshes will occasionally sweep the precious metals from these beds, and spread it over a wider surface; sometimes it will be found heaped together against a ledge of rocks, or scattered in thinner quantities along the banks of a stream, if the latter happens to be a little sluggish in its course. Occasionally it may be met with at the roots of certain tufts growing by the sides of the rocks, or on the bed of a rock, or mingled with the gravel at the limit to which the action of the river flows, or freshets reach; but, wherever met with, the

precious metal is invariably in the same condition, viz., in dust, scales, or lumps, and appears as though it had just escaped from its matrix.

There is, however, an observable difference between the old and new deposits. In the former the gold is seldom found in the purest water-courses, which occasions the difference between what are called the "dry" and "wet" diggings in the recently discovered deposits. The dry diggings are in the old drift on the more elevated banks, while the wet are in the beds of the rivers; yet it is difficult to preserve the distinction, for what are called the "wet" diggings, in many instances, include both the old and new deposits. On the discovery of a deposit in a given part of the river, it must not be inferred that gold will be found along its whole course; the deposit depends upon so many circumstances; but it is generally found near the base of the mountains whence the metal has been disintegrated. The bulk of the gold will naturally be deposited at each fall or weir of the river, and when the water reaches the low and flat lands, a few miles of its sluggish flow will thoroughly sift from the precious metal all the detritus brought down from above.

We have not space to enter upon the disputable points connected with the origin of gold, however we might be disposed to mingle in the fray, and, therefore, shall content ourselves with giving a simple summary of the differences which exist, amongst the leading authorities, on this important question. We have, however, a notion—we cannot dignify it with the appellation of a theory, and it scarcely deserves that of an hypothesis—of our own, to which we alluded at the outset of this chapter, and if it do not lead to the establishment of any point itself, it may probably furnish a scintillation to others, who are in the pursuit of geological truths. But of this anon.

The geological surveys however of the Californian range of the Sierra Nevada, by the American Commissioners,* seem to strengthen the opinion of Sir R. Murchison, that "*gold was the last formed of the metals.*" "A very little attention to geological science," writes Sir Roderick, "will have informed the reader that, in the long preadamite periods of time during

* Reports of Messrs. Tyson and King; especially the former.

which various successive races of animals passed away, each epoch was accompanied by great accumulations of water-worn and rolled pebbles. These pudding-stones, or conglomerates, are of all ages, from the oldest to the youngest sedimentary deposits which have been found under water. Now, the western flank of the Ural is specially rich in grand, loose piles of stones, derived from the very ancient adjacent rocks, some of which were washed down into the former sea just at the close of the older palæozoic periods; others re-occur in a great system or group of the younger palæozoic strata to which I have assigned the name of Permian, and which, being of the same age of the magnesian limestone of England, are older than the secondary rocks. The Permian conglomerates, formed when certain land-plants and the first huge lizards appeared, but long before a mammal was created, were clearly all composed of the rocks of the Ural mountains, because every pebble in them has been derived therefrom; and with these pebbles we find also quantities of iron and copper detritus, together with land-plants—*but no gold.* We therefore not only infer that these Ural mountains were the lands in which the plants grew, and on the edges of which the great aqueous lizards fed, whose remains we find in these pudding-stones; but we also know from the debris that copper and iron must have then existed in that chain. Nay, further, the discovery of water-worn lumps of magnetic iron ore in the copper deposits of the Ural mountains themselves, has led to the belief that iron was the first formed of these two metals in this region. What, then, was the metal which followed them? Seeing the depth at which silver occurs in other regions (there is very little of it in the Ural), and how it is associated with lead, we do not, in the absence of direct proof, absolutely contend that it was formed after copper. In reference to gold, however, we believe that, together with platinum, it was the last formed metal. At all events it is a legitimate inference, that gold did not exist in those mountains when the Permian deposit was formed upon the flank, seeing that not a vestige of it is to be detected amid the copious detritus of copper and iron ores in the conglomerate of that age."*

* "Quarterly Review," 1850.

Sir Roderick further remarks that in the vast changes which came over the surface of this planet, the result was the formation of much gravel, shingle, and sand, which, when occasionally compacted, as in our own gravel of Kensington and Hampstead, is the youngest of all the great conglomerates. This is the only one of the whole series of geological conglomerates, according to this eminent authority, in which gold has been found. In none previously formed, he remarks, has any notable quantity been detected in any country; and that it is in the superficial detritus, more or less similar, resulting from the grinding down of the former tops of mountains, that whatever gold is worth collecting is invariably found, not only in the Ural mountains, but all over the surface of the earth.

The eastern range of the Sierra Nevada presents certain features which strongly support the deductions of Murchison. There the usual phenomena of the Permian period present themselves, which invariably denote the absence of gold.

"It is probable," says Mr. Tyson (Mr. King writes in a more positive manner) that different systems occur on different sides of the Sierra Nevada and Cascade mountains. Indeed the numerous large volcanic peaks favour this presumption A judiciously planned and efficiently executed survey may be expected to develop other classes of veins *containing silver, copper, and other metals;* perhaps, also, the veins next the granite axis of the Sierra may contain ores of tin."

This view of the geological features of the eastern range of the Sierra Nevada has been since confirmed. An able and scientific observer * writes thus:—"It is remarkable that gold has been found almost invariably on the western or Pacific side of the great range, while silver, copper, and lead are discovered on the eastern side, at a much higher elevation."

Mr. King† is of opinion that gold exists in *combination* with the veinstone, and is not simply *disseminated* therein:—

"The gold, whether in detached particles and pieces, or in *veins*, was created in combination with quartz." . . . The rivers in forming their channels, or breaking their way through the hills, have come in contact with the quartz containing the

* Mr. Brackenridge. † Report.

gold veins, and by constant attrition cut the gold into flakes and dust."

We agree with Mr. Tucker that attrition would wear, or rub off, certain portions of gold into a state of powder or small grains, but that it is difficult to conceive how a metal, having the peculiar properties of gold, could be *cut* into flakes by the means here indicated. As regards the *veins*, that will bring us at once to the point at which we are desirous of arriving, and we shall endeavour to show that Mr. King has taken a somewhat cursory and erroneous view of the subject.

Whatever diversity of opinion there may be amongst geologists upon the nature and origin of *veins*, there is a common agreement among them upon these points,—that in all metalliferous districts there are several systems of veins traversing the same rocks, each system preserving the parallelism of its own veins with singular regularity; and, secondly, that different classes of veins have different contents, while the contents of the same vein almost always vary in proportions when the vein passes through a different kind of rock.

The means by which veins have been filled is altogether an unsettled point in science. Veins usually are nearly perpendicular; it is rare to find them inclining as much as 45°. Each system of veins in a district has its own direction or strike. Those first formed are intercepted by the next, and so on successively; their relative ages being determined by these intersections.* The subject of veins has been practically investigated both in England and in Saxony; in Cornwall there are eight distinct systems of veins, and in the Freyburg district of Saxony they have the same number. If veins were filled, like dikes, by the injection of matter in a state of fusion from below, we should occasionally observe an overflow and deposit upon the surface. There are several overflowings from *dikes*, but none from *veins*. This objection is considered by many as fatal to the theory of injection; others, probably of an equally untenable nature, have been suggested. That of electric agency, for example, has attracted considerable attention, since Mr. Fox, after several experiments, succeeded in forming well-

* Geo. Trans. Cornwall. Carne.

defined metalliferous veins by means of voltaic currents, under circumstances supposed to exist naturally in Cornwall.* The rents and fissures in rocks have probably been produced by the same agency as earthquakes, and also by the contraction of masses of heated rocks in cooling. These rents or veins continue for great distances, passing through various strata of the different kinds of rock in their course, and usually to depths greater than the miner has yet reached, though the earth has been mined to the depth of nearly 2000 feet. In thickness they vary from an inch to several yards, the thick veins sometimes dwindling to a mere thread, and again suddenly enlarging. The largest known vein in the world is that near Guanaxato, in Mexico,† which varies in thickness from twenty-five to fifty yards; and the next, we believe, is in Derbyshire, which averages about twenty-three yards. The Mexican mine, according to the high authority quoted, was worked for silver to a depth of 1,080 feet, and for a distance of six miles in a horizontal direction. In most cases, veins are richer in metals in rocks of sedimentary origin than in those of igneous formation; but when both classes of rocks are found in combination, especially at the point of contact or juncture, there is invariably a larger amount of metals and ores. The minute veins, in most series of rocks, are more or less simple in their composition; they frequently consist of a single mineral, the nature of which generally bears some relation to the constitution of the containing rocks.‡ Thus, quartz-veins are found in all rocks, since all rocks abound more or less in silica; but they are most frequent in rocks where the latter predominates. Calcareous veins indicate lime as the composition of the rock, and the magnesian minerals, such as asbestos, steatite, &c.,

* Almost all our leading geologists seem to have eschewed the important subject of *veins*. Neither Murchison, Buckland, nor De la Beche, have done more than simply allude to them. Nor has Professor Ansted, in his highly-interesting little volume, "The Gold-Seeker's Manual," stepped beyond the limits of a mere allusion to them, although so appropriate an opportunity presented itself, while describing the nature and condition of gold in different parts of the world. The ablest treatise we have met with, apart from the contributions of Mr. Carne in the Geological Transactions of Cornwall, on the subject of *veins*, is the Treatise on Primary Geology by Mr. Boase.

† Humboldt. *Nouvelle Espagne.* ‡ Carne.

characterize the serpentines. The granitic and schistose rocks are also distinguished in their series by the peculiar mineral which happens to predominate; thus hornblende, chlorite, schist, or mica, may be traced in patches wherever they separately prevail. Sometimes, however, the substance of these veins is compound, exhibiting distinct crystalline mixtures of two or more minerals, which is deserving of particular attention, as the largest quantities of gold are found in veins of this kind. The quartz, or matrix of these veins, is frequently crystallized in the central parts, so as to form drusy cavities, or elongated openings, which are usually lined with the minerals. Here, also, is a receptacle for gold; and when these veins exhibit small, well-defined, rounded grains of quartz, which are sometimes of a different colour from that of the base, in connection with rounded and angular grains of felspar and scales of mica, gold is almost sure to be present. But when chlorite and talc, which occasionally pass by insensible gradations into each other, and in this state supply the place of mica, are found in gneiss formations, there the precious metal is frequently found in the greatest abundance.

These several indications are deserving of attention, as they will save a great deal of labour in the search for gold, it being too frequently taken for granted that if the precious metal be found in one portion of the mountain range, or series of rocks, it may be found in the whole. This notion is commonly entertained; but experience, and the further investigations of science, will prove it to be quite erroneous. We have before us, while we write, two separate pieces of the Australian rock; and where they were broken from the parent rock, gold has been found in considerable quantities. The component parts of these pieces are nearly similar; but the one that contains the usual indices of gold has precisely the formation described above, while the other is essentially different, although separated from the rock within fifty yards of the former. Yet both would answer to the description given by Sir R. Murchison of the formation indicative of the presence of gold, quoted at the commencement of this chapter, and which induced us to remark that that description was of too general a character.

The particulars which we have ventured to point out will lead, we hope, to further enquiry, and to a consequent economical advantage, which has not hitherto obtained.

The origin of gold deserves a passing remark or so, were it simply to register the *postulata* of the leading lights of geology. One writer,* of no mean capacity, has hammered out the grain of metal which emanated from the rich ore of Buckland's mind in the following manner :—

"By what process or operation of nature came these seams, or veins of gold, to be deposited? Was it the agency of fire, or by water and alluvium? I think it probable that both may have been at work, being the two greatest solvents in nature, and at the same time the greatest crystalizers : perhaps metallic ore may be the work of alluvium, and the production of pure metallic substances that of heat. With respect to gold, I think the latter theory is more reasonable, as it is always found in a pure state; whilst the quartz (pure silex) in which it is contained may be alluvial, and one of the earliest deposits, from the decomposition of the original unstratified mass. But where shall we seek for the original supply of the precious metal? How is it found, or whence has it been extracted by the agency of heat? It is not enough to say that, like other metals, it is found diffused through all nature; for an appreciable quantity of gold has been extracted from violets. In my opinion it exists in the original unstratified mass, in imperceptible proportions, but proportions varying in different places, other metals being more or less abundant. The greater proportion of our soils are formed, according to Sir H. Davy, by decomposition of the original mass, and this accounts for the diffusion of gold in small particles, which may be taken up by plants, and enter into the composition of organized bodies. If, then, the unstratified rock is the original seat of the metal, but in particles infinitely minute, it may have been separated by a very high degree of heat, by which it would be sublimated, or volatilized, and thus carried upward by chemico-electric force, and by a process resembling distillation. In this way it would penetrate the quartz rock, or be condensed in the spaces of the laminated

† Brackenridge.

strata, such as talc-schist or mica-slate. Such is the theory of Buckland and other modern geologists. It may be mere speculation; but one thing is certain, as may be seen at once by those who have examined the larger masses of gold brought from California, that the finer particles of gold have been run together by a second operation of heat, sufficient only to fuse them and separate them from the quartz. The first was distillation, the second smelting, or rather simple fusion. It is possible that these great operations of nature have been repeated at different intervals, and different seams of quartz and gold may be found in ascending the ravines, the lower more completely scattered through, but in finer particles, and the higher having undergone afterwards simple fusion."

Another has put forth an hypothesis of a different nature. We quote the able report of Mr. Tyson :—" A writer has suggested the gold to have been ejected from volcanoes, and scattered far and wide over the country." This suggestion may be dismissed with very few remarks, as all testimony is against it. There are about three hundred volcanoes, now known to be what is called " active," and a far greater number extinct; and it has not yet been observed that gold is among their products. " Now," says the Report, " between the Yuba and American rivers, a distance of more than seventy miles, wherein so much gold has been obtained, there is a total absence of all such volcanic fragments. The greatest horizontal distance that any fragment has been known to have been thrown from a volcano does not exceed nine miles." This, we apprehend, is proof sufficient of the instability of the argument.

In our next chapter we shall show how gold is produced, whether by washing or mining. Humboldt remarks that the richest gold deposits are those which are derived from ridges having a meridian direction. Erman opposed this. Murchison is of opinion that a much greater quantity has been obtained from chains having a nearer relation to north and south than from those approaching to equatorial, or east and west directions, due, perhaps, to the general form of the chief masses of land, and the prevailing strike of the palæosoic rocks. Yet the great gold-bearing chain of Africa has an east and west direc-

tion, and seems as highly auriferous as any yet developed, and indeed much more highly, for it has been the principal supply for some thousands of years, and is still worked for the precious metal. As experience, however, widens the basis of generalization, these opinions will doubtless undergo a corresponding modification.

CHAPTER III.

THE METHOD OF OBTAINING GOLD, AND ITS GENERAL DISTRIBUTION.

ALL investigation has hitherto shown that gold is by no means partially disseminated throughout the globe, but that it is extremely limited in quantity. The rich yield of California, of Australia, and we may add of the Ural Chain, though in apparent contradiction to our postulate, will, on examination, furnish the strongest proof in its favour, The metal is found in these auriferous regions as elsewhere, namely, in extremely small particles, seldom in its parent rock, and, when traced home to its source, in so pure and compact a state, that each piece indicates, at once, that it originally received a distinct and isolated formation. We shall not venture upon the untrodden ground of science, but simply keep in the path which those of bolder step than ourselves have marked out, and rest content with the ordinary facts which observation and research have thrown in our way. If diamonds were found as large as hen's eggs, and rubies and emeralds the size of an ordinary potato, we might have some doubt as to the precise natural condition of gold; but, as practical experience shows that the diamond is produced in the same form and substance, however slightly it may vary in purity,—which does not effect the proposition,—whether excavated from the mine of Golconda, or from that of Brazil, it is fair to presume that gold is subject to the same conditions. Nature works by great general laws, which produce similar results throughout the globe. Copper ores

have the same broad features of resemblance, whether excavated from the bowels of the earth at Cuba or at Adelaide, although the distance between these places is measured by some thousands of miles; and a lump of coal cropping out, or dipping in its native bed, is the very counterpart of the same mineral, whether mined in the County of Durham or in Vancouver's Island.

The gold deposits, therefore, of California and New South Wales, are precisely analogous to those of the Ural Chain, which have everything in common with other auriferous regions, both as to the quantity produced, the quality of the metal, and the peculiar conditions under which it is found. History furnishes us with a clear and strong light to direct our inquiry on this head. There is scarcely a chapter in the Old Testament but bears testimony to the abundance of gold in remote ages, and that it was equally cherished, and as eagerly sought after, as at the present day; but it cannot fail to strike the reflecting mind that the high value put upon the precious metal implied its comparative scarcity, and the great difficulty of obtaining it, otherwise we should not perpetually see gold placed in the fore-ground whenever the riches, the power, or the earthly grandeur of kings and princes are so studiously catalogued. We know, also, from collateral testimony, which we shall shortly adduce, that the great bulk of the gold mentioned in sacred and profane writings was gathered precisely in the same way as at the present day, namely, in the beds and sands of rivers, and that little of it was the produce of mining operations. We have also abundant proof that gold was one of the great articles of commerce, long before it was adopted as a standard of value amongst certain people, and was held in high estimation by those especially who lived in large cities, and were engaged in trading affairs. We, therefore, find it naturally flowing towards the great centres of communication, and gladly taken in exchange for the choicest productions and the most highly valued commodities. The gold-dust of Africa found its way throughout the whole of Asia, and ultimately became the leading commodity in the great marts of early Europe. Now, had nature produced gold as abundantly as

other metals it would soon have been discovered, and a larger quantity brought to market, which must have materially affected its value; but, as it seems as eagerly sought after now as it was four thousand years ago, and still maintains its relative value, it is reasonable to assume that the quantity of gold is but limited, and that nature has been at all times extremely chary in its production. But it may be said that the quantity of the precious metal found in the three great modern deposits, if we may be allowed such a term, would seem to imply that nature does not always work uniformly in her laboratory, but that, on the contrary, she occasionally indulges in partial freaks, and in ununiform profusion. A superficial view may, perhaps, lead to such a conclusion; but if we only enlarge the circle of our observation, so as to embrace the great general operations of nature, we shall be led to a very different conclusion.

The production of gold is a result apparently depending, as regards quantity, upon simple accident. Observation has proved that gold is produced by certain elemental changes, which periodically take place in the internal part of the globe, and whether it be of aqueous or igneous origin, or perhaps of both, its quantity is mainly determined by the nature and amount of the forces in activity. Now, whenever the old formations have been highly metamorphosed by the intrusion of igneous rocks, in certain mountain ranges, or, in other terms, whenever clay-slates, old lime-stones, and grey-wacke sand-stones have been penetrated by green-stone, porphyry, sienite, granite or serpentine, and consequently in a more or less metamorphic condition, the gold naturally occurs in larger quantity than elsewhere. To affirm, therefore, that nature occasionally produces gold in abundance, and *vice versâ*, is simply to affirm that elements of a certain magnitude and power will produce a greater result than those which are proportionately less: in short, to assert a simple truism.

But there is this peculiarity in connection with gold being produced in abundance,—that nature herself on those occasions invariably turns miner, and spreads open to the eyes of man this precious treasure; whereas, in most of her inferior productions,

he must labour hard and dig deep, ere he can become possessed of them. Whether this be a simple result or not, does not so plainly appear. It is true that the component parts of the eruptive rocks, in which gold is imbedded, are subject to very great superficial atmospheric changes; and, as the precious metal lies on, or near, the surface of its natural bed, it is soon subjected to those atmospheric influences, which quickly produce external changes. A few torrents, or so, rushing vehemently down the mountain side, in which it is superficially buried, hurls it here and there, until it happens to become arrested in some gulley, or gets lodged in the bend or creek of a river. Hence the abundance of gold in the water-courses, creeks, gullies, and ravines of mountain ranges, which, more or less, exhibit the usual phenomena; and to suppose that the precious metal may be found in still greater abundance in the bowels of the rocks, merely because they have exuded the quantity you find in the adjacent streams and localities, is simply to expect the kernel in the nut after it has been carefully extracted.

At the first blush, the quantity of gold found in the three great deposits is certainly so abundant that it would lead to the inference that still greater quantities were yet to be obtained from the same source. This, however, will prove a mistake. The gold-seekers, at the present time, are working at what may be termed the cream; and, as the latter is cleared off, the skimmed-milk,—the metaphor allowed,—which remains, will scarcely repay the labour expended upon it. There is no new feature in such a result; it has been so before, and will be so again, in the event of other deposits being stumbled upon, which have hitherto escaped the cupidity of man. We shall now endeavour to elucidate the text of the chapter, after this long digression; and as we could not find a more appropriate place for these views than in connection with mining operations, we shall make no apology for placing them here.

The search for gold, whether in the sands of rivers, or in the veins of mines, may be traced to a very high antiquity; and as well as we can pierce the hazy gloom which sets in when we enter upon Egyptian affairs, mining appears to have

been practised in that country at a very early period, and the silting of sands in the water-courses for the precious metal at a still earlier, if we may rely upon the testimony of the Scriptures. "And a river went out of Eden to water the garden, ... The name of the first is Pison. That *is* it which compasseth the whole land of Havilah, where there is gold; and the gold of that land *is* good."* This, evidently, must have been stream-washed gold, which is generally free from any earthy admixture, and was what the Greeks termed *ακεφθον*, or such as had not undergone the process of fusion. At this early period the quality of precious metals seems to have been carefully attended to, or the expression "good" would not have been employed in the text. We have a further confirmation of the fact, in the terms with which the earliest transfer of property is recorded. "And Abraham hearkened unto Ephron; and Abraham weighed to Ephron the silver, which he had named in the audience of the sons of Heth, four hundred shekels of silver, *current money* with the merchant."† It is clear that a peculiar kind of silver was paid, known as the silver of commerce, which must mean money of full weight, or unalloyed, such as a merchant could receive in his business transactions. Here, then, is a step beyond refining the precious metals; it is, in fact, the adoption of a standard of value, and the earliest on record. But we are somewhat premature in noting this part of the subject.

Viewing ancient history by the light of modern, there is no great difficulty in tracing the source whence Egypt of old derived the principal supplies of the precious metals; and when we reach the source of supply, we can easily descry the method of procuring them, whether by mining or by silting the sand in the great water-courses. Gold is found in Africa, at the present day, under precisely the same conditions as it was in the age of the Pharoahs, and the principal source is in the Kong mountains, that great chain which stretches right across the Continent of Africa from east to west. The

* Gen., ch. ii., v. 10—11.

† Gen. ch. xxiii. v. 16. The Septuagint uses the words, *αργυριου δοκυμου εμποροις*.

metal is principally obtained from the deposits of the mountain torrents, after the rainy season has passed away, and the mode of separating it from the sand is extremely simple.* The inhabitants dig pits about forty feet deep, at which point the greatest portion of the metal generally shows itself, so that the superstratum of debris must be very considerable; nevertheless, the quantity obtained is so great among many of the inland negro nations, that the common utensils of their kings are made of it. Bowdich, in his Mission to Ashantee, gives a vivid description of the king and his court, where gold was displayed in the most abundant variety. Gold dust, therefore, is necessarily an article of commerce and exchange with the several merchants who trade in their markets, and business at the present day is transacted in the same manner as it was when Egypt was a great nation, and Nubia and Ethiopia the rich mines whence she drew her supplies of gold.

Here is a striking feature of the present Egypt. Speaking of his father, who was in search of his brethren, Abu Bekr says,† "They went to the town of Jenneh, and afterwards to Ghoneh. There they abode, and continued to serve their master, collecting much gold for him there. *In that country much gold is found in the plains, banks of rivers, rocks, and stones.* They break the stones, and grind them, and reduce them to dust. This is then put into vessels, and washed with water till the gold is all collected under the water in the vessels, and the dust lies above it. They then pour out this mud upon the ground, and the gold remains in the vessels, and they spread it out to dry. After that they try it on a touchstone, and make such things of it as they are able. They also barter gold for goods."

Another description, equally characteristic of the unchanging habits of the people, is furnished by an intelligent traveller:‡— "This town (Misselemiah) is famous for its market, and is the resort of many merchants from Souakin, who bring cotton, spices, and perfumes to exchange for gold. Others from Abyssinia bring slaves, and a few horses. The Souakian mer-

* Description de la Nigritie, p. 140. † Routes in North Africa, 1836.
‡ Lord Prudhoe's Notes on a Journey from Cairo to Sennaar, 1835.

chants bought gold with dollars for the Indian trade. The whole time the market lasted Hadji Shoomee sat with his scales before him, weighing gold gratis to all comers. It was brought in pieces or rings of different sizes, from 30 paras (2d.) to 240 piastres (£3)."

In addition to these supplies, which, with slight interruption, poured in periodically, Egypt possessed mining resources within herself, and, as it were, immediately at her own door. The mines of the Red Sea, which Agatharchides has left us an account of,* were worked at an early period. That author lived in the century preceding the Christian era, and the mines had then been worked from a very remote date. The account which he gives of the process of mining, with the minute details of labour, is so interesting, that we shall make no apology for transcribing it *in extenso*:—

"The kings of Egypt compelled many poor people, together with their wives and children, to labour in the mines, wherein they underwent more suffering than can be imagined. The hard rocks of the gold mountains being cleft by heating them with burning wood, the workmen then apply their iron implements. The young and active with iron hammers break the rock in pieces, and form a number of narrow passages, not running in straight lines, but following the direction of the veins of gold, which is as irregular in its course as the roots of a tree. The workmen have lights fastened upon their foreheads, by aid of which they cut their way through the rock, always following the white veins of stone. To keep them to their task an overseer stands by, ready to inflict a blow on the lazy. The material that is thus loosened is carried out of the galleries by boys, and received at the mouth by old men and the weaker labourers, who then carry it to the epoptœ, or inspectors. These are young men under thirty years of age, strong and vigorous, who pound the broken fragments in iron (*qy. copper ?*) mortars with a stone pestle, till there is no piece larger than a pea. It is then placed on grinding-stones, or a kind of mill-stones, and women, three on each side, work at it till it is reduced to fine powder. The fine powder is then passed on to

* Long's Egyptian Antiquities, ii. 9.

a set of workmen called sellangeis (Ζηλλαγγεῖς), who place it on a finely-polished board, not lying in a flat position, but sloping a little. The sellangeus, after pouring some water on the board, rubs it with his hand, at first gently, but afterwards more vigorously, by which process the lighter earthy particles slide off along the slope of the board, and the heavier parts are left behind. He then takes soft sponges, with which he presses on the board rather gently, which causes the lighter particles to adhere to the sponge, while the heavy shining grains still keep their place on the board, owing to their weight. From the sellangeis the gold particles are transferred to the roasters (ἑψηταί), who measure and weigh all that they receive before putting it into an earthen jar. With the gold particles they mix lead in a certain proportion, lumps of salt, a little tin, and barley bran, and putting a cover on the jar that fits tight, and smearing it all over, they burn it in a furnace for five days and nights without intermission. On the sixth day they cool the vessel and take out the gold, which they find somewhat diminished in quantity: all the other substances entirely disappear. These mines were worked under the ancient kings of Egypt but abandoned during the occupation of the country by the Ethiopians, and afterwards by the Medes and Persians. Even at the present day we may find copper chisels or implements in the galleries (the use of iron not being known at that time), and innumerable skeletons of the wretched beings who lost their lives in the passages of the mine. The excavations are of great extent, and reach down to the sea-coast."

In the valley of Mehadia, in Southern Hungary, the writer of this little book saw a similar process of separating the sand and the gold. The sand is gently but constantly agitated upon a series of planes, nearly horizontal, but slightly inclining downwards the one to the other; this action causes the lighter portion to be carried forward, while the heavier particles, including the gold, subside at the bottom. After repeated washes of this kind, the heavier portions are subjected to mercury, when the amalgamation is conducted in the usual way. But in the northern mine at Kremnitz, and at Böckstein, in Upper Austria, a more skilful process is adopted to extract the

metal. Whenever the latter is held in chemical combination, as it frequently is, with arsenic and sulphur, it is sent direct to the smelting-houses at Lend, where it is most effectually extracted.

With the slight exception of the sponge and the mercury, these two modes of mining are precisely alike, although their operation is separated by a period of nearly three thousand years. It is true there are no slaves in Hungary; but the labour is exceedingly severe, and the profit in a series of years, after deducting the expenses of labour, is but very uncertain and very small.* It appears, however, that the works of Böckstein, on the whole, are carried on at a loss; so, also, are those of Transylvania;—while the Hungarian department, in certain instances, shows a fair profit. In 1844, the balance was against the Transylvanian department, in the sum of 112,671 florins, or £11,267 sterling; while the same year shows a profit in the Hungarian accounts of 278,081 florins.

Comparing the preceding statement of the mining processes of ancient Egypt with those of modern Europe, it appears that little advance has been made in extracting gold from the earth; and the inference is but too painfully suggested that mining operations for the precious metals generally lead to the misery and impoverishment of those who pursue them. "Truly there is a vein for silver, and a place for gold which men refine,"† exclaims Job in his treatise on mining, which is one of the most valuable economical contributions to Holy Writ, and clearly shows that the Arabian patriarch was as well versed in mining as many of our Cornish men, and that he must have witnessed, if not practised, those operations himself. The verse just quoted may, for ought we know, refer to the mines of the Red Sea, for Job was a man of rare intelligence, which could only have been acquired by practical observation; and as there were few or no gold mines in Arabia, according to a great living authority,‡ although Heeren's learned sugges-

* The *Montanisticum*, or mining department, containing six branches, is so strangely jumbled, that it is difficult to get at the data required.

† Job, ch. xxviii. v. 4. Dr. Noyes' version.

‡ Quarterly Review—article Siberia and California, 1850. Heeren's Historical Researches—Asiatic Nations, vol. i. p. 349.

tions point in an opposite direction, it is very probable that the wandering Arabian frequently found his way into Egypt, and passed through a great portion of Ethiopia, where he might have seen the precious metal gathered in grains from the water-courses, and occasionally in lumps from actual mining operations.

The quantity of gold, however, derived from the mines must have been limited, as compared with that derived from the river-washings; and it is fair to infer that the mines would not have been worked so effectually had the trading intercourse of the Egyptians and Ethiopians been less frequently interrupted. The wars that took place between the kings of the north of Africa and those of the south, caused a serious disturbance to the caravans which journeyed to different points for trading purposes, and which comprised the merchants who brought not only their gold dust, but their ivory, and their slaves, to exchange for the produce of the Egyptian looms. The precious metal, which found its way into the great circulating arteries of the world through this medium, could be procured at a much cheaper rate than when it was wrung from the reluctant bowels of the mine.

The Carthaginians obtained their gold principally from the source just mentioned, while their progenitors, the Phenicians, found a rich harvest in the peninsula of Spain, which they turned to profitable account in the East. The site of Ophir is still an unsettled point, though so large an amount of learned conjecture has been expended upon it, and, if it ever be settled, the probability leans to the conclusion, that the great quantity of gold circulating through Arabia and Syria must have been derived from the washings of sands rather than from the veins of ores.

The gold of the Greeks was principally procured by washing the sands of the more rapid torrents that descended from the mountains. Herodotus describes the Pactolus as running by Sardis, "which in its descent from the mountain Tmolus, brought down a quantity of gold dust." The fable of Midas, who had acquired, by washing in the Pactolus, the power of converting whatever he touched into gold, is familiar to every

reader of ancient history. So also is the main incident in the beautiful poem of the Argonauts, which has its origin in the gold mines of Colchis, instead, however, of the return cargo of the precious metal being described in the brief style of our bills of lading, the poet's imagination has woven it into a vivid narrative of fancy and fact, so that we are completely in the dark, both as to the quantity procured and the method of procuring it. The story of Crœsus, King of Lydia, is equally familiar to the classic reader; and Pytheus, who, according to Larcher, was the proprietor of both gold and silver mines of great richness, was obliged to enact that only one-fifth of the citizens should be compelled to devote themselves to work in the mines, as the employment of the whole caused such a great scarcity of food. The silver mines of Laurion are intimately connected with the economical history of Athens, and the mode of working them is minutely described by a learned German, and as elegantly translated by an English scholar.*

The Greeks advanced a step beyond the Egyptians in the art of mining. The ores seem to have been sifted after being pounded in the mortars; for the sieve is mentioned among the tools of the miners. They likewise used the bellows and charcoal.† The gold was melted by a gentle fire, with the addition of a mixture of salt, nitre, and alum, by which substances the silver was purified. Though the Greeks were acquainted with quicksilver, and had plenty of cinnabar, which they used as paint, they were ignorant of its peculiar properties, or they would have applied it to quicken the process of separating the precious metals from the substances with which they were mostly found. According to Pliny, one Callias, an extensive worker of silver mines in Attica, found cinnabar in his ore without knowing its value, so nearly two thousand years afterwards the Peruvians worked the silver mine of Guancavilica long before they discovered the properties of the same material. There is a remarkable passage in Theophrastus on the subject of mining (de Lap. c. 119) which is

* Public Economy of Athens, Bœckh. Translated by Lewis.

† Precious Metals. Jacob. The Egyptians also used the bellows, which is proved by the drawings of Rosellini.

worth quoting :—"Those who dig," says that intelligent writer, "in the mines cannot stand upright at their work, but are obliged to lie down either on their back or on their sides; for the vein of the earth they dig runs lengthwise, and is only of the depth of two feet, though considerably more in breadth, and it is inclosed on every side with hard stones, from which the ore is drawn forth." This formation of vein, however, relates to the silver mines, and not to gold.

Passing from the Greeks to their great imitators in industrial pursuits, the Romans, we find no records of mining amongst that singular people before the commencement of the first Punic war, in the year 490 from the foundation of Rome. The Salassi, who inhabited the modern province of Aosta, mined for gold and other metals, but procured a scanty supply. The Po is said to have yielded some gold in its sands, but none has been found for a very long period; yet, according to Pliny, there was an express law of the senate against working the mines, at the same time remarking, that "Italy yields abundance of metals."

This is somewhat enigmatical, and might have remained so, had not modern science brought to light the fact, that Italy never has been a gold-producing country, and never could be, as the formation of her rocks is opposed to the production of that metal. *Italy contains no old rocks which have been mineralized*, and assuming this geological fact to be conclusive, we are disposed to agree with a distinguished authority * who remarks that the senators simply passed the law to flatter the national vanity of the Romans.

All the mines, however, of the precious metals were gradually delivered over to the dominion of Rome, by her conquests of the countries in which they were found. Carthage, Spain, Germany, Greece, Asia, and Egypt, within little more than 140 years after Rome had pushed her cohorts beyond the Hellespont, became subject to her rule. By the time that Augustus had reached imperial power, the mineral wealth of the world might be said to flow into his treasury, and the Capitol naturally became the great centre of action for the empire,

* Quarterly Review, 1850.

absorbing the gold and silver, which, otherwise, might ha proportionately circulated at its extremities. The great genera and pro-consuls remitted to Rome vast sums, which were mostl the fruits of confiscation, so that the centripetal action of th precious metals, by this means, became much greater than th centrifugal. The supply, however, of necessaries required b the Capitol materially diminished, and in some instance drained, this accumulation of the precious metals. Pliny writing of the mines of Spain, which appear to have been th principal source of supply, antecedent to those of Dacia, says :– "Some have related that Asturias, Gallicia, and Lusitania fur nish 2000 pounds of gold annually; but Asturias supplies th most; nor in any other part of the world, during so many ages has so great a quantity been obtained. In every species of gol there is a proportion of silver; in some one-tenth, in others one ninth, and in one instance only one-thirty-sixth was discovered.' These mines were worked by slaves; but the statement of the quantity produced must be greatly exaggerated.

Under the reigns of the earlier emperors, a new system of working the mines was adopted. Instead of farming them out, the government appointed its own officers, and had the whole management under its own control. This reform rendered the mines more profitable, as not only economy of labour was introduced, but the best portion of the production was preserved, which had not been the case under the preceding management. The government possessed the mines, and the adjacent lands, which were occupied by a kind of *adscripti glebæ*, who cultivated the latter on a similar condition to the *corvées* in France. These occupiers were compelled to give their services and that of their offspring to the mines, and received the appellation of *glebæ et metallis adscripti.** Slaves were also employed in the mines; not those which were ordinarily bought and sold, but criminals, who had been condemned by law to slavery. The gold mines of Dacia, (the present Hungarian mines,) were worked in the time of Trajan under the direction of a *collegium aurariorum;* but there was little skill displayed, and the production was proportionately diminished. The great produc-

* Cod. Theod. de Metallis, lib. 6, s. 9.

tiveness of the Spanish mines just cited, according to Strabo, had put a stop to the working of those of Upper Italy. In the fifth century the mines had almost ceased to be productive throughout the empire, which may be attributed in a great measure to the irruptions of the barbarians. The last glimpse we obtain of the government taking an interest in them, is the appointment of a *comes metallorum* over the mines of Western Illyria in the year 413.*

Royalty.—By the law of antiquity, as exercised among all ancient nations, and at a subsequent period adopted into the civil law, all the mines and mineral deposits of gold or silver ore, or of precious stones, belonged, if in the public lands, to the sovereign, and formed a part of his patrimony; but if they were on private property, they belonged to the owner of the land, subject to the condition that, if worked by him, a tenth of the produce was to be delivered to the prince; but if worked by any other person, with the consent of the owner, two-tenths were to be paid by the operator, one to the sovereign, and one to the proprietor of the land.

The inhabitants of this island had carried on mining operations several centuries before the Romans had obtained a footing in it. The existence of gold may be presumed, from the money circulating among the inhabitants, when the Romans first cultivated their acquaintance. Strabo informs us that silver mines were worked, and several parts of Cornwall seem to strengthen the remark. In the time of Julius Cæsar iron was so scarce that pieces of that metal had replaced the gold; yet, one century later, the former had so increased in quantity as to become an article of export.† But tin was the principle metal extracted from our mines. Dr. Jamieson remarks,‡ that "gold was found in the alluvial land, and was formerly washed for in the neighbourhood of Leadhills." He thinks the gold was derived from transition rocks, and chiefly from quartz veins in those rocks. In the reign of James V., three hundred men are said to have been employed for several summers in washing for gold, and to have collected £100,000 sterling. The average produce of each labourer varied from 3d. to 4d. per day, which

* Code Theo. lib, 7. † Strabo b. 4. ‡ Mineralogy of Dumfriesshire.

was a considerable object when wages were only 2d. But when wages rose to 4d. the undertaking was no longer profitable, and was soon abandoned.

The decline of the Roman empire, and the consequent disturbance of industrial pursuits, especially that of mining, materially diminished the quantity of the precious metals; and, in the centuries which followed, the value of coined money became greatly advanced, particularly gold. From the seventh to the fourteenth century the tributaries of the Elbe yielded a considerable quantity of the precious metal, and the alluvia of certain portions of the Rhine still proves slightly auriferous; but neither of these sources are now deserving of special mention. In Ireland there are indications of gold occurring in more than ordinary quantity, as the washings in the Wicklow streams at Crogan Kinshela proved; but although the mountains of the sister kingdom gave many of the outward and visible signs of the precious metal, the search for the inward substance proved as great a disappointment as has occurred, under the same circumstances, elsewhere. In several parts of Europe there is gold produced, either in washings of the streams or by mining, but in such small quantities, if we except Hungary—the principal source of European supply—that they are scarcely deserving of notice, were it not to illustrate the general diffusion of the precious metal, and the equally general capriciousness of its quantity, when compared with that on its being first discovered.

The discovery of America opened up a rich supply of the precious metals, and naturally attracted great attention. Gold poured into Europe in such abundant streams, when something like a connected transit was established, that it seems almost fabulous to recite the accounts. It appears by the Register, or Entry-Book of Seville, that "from the year 1519 to that of 1617, there came into Spain 536 millions of gold* pistoles." When the Spaniards first landed on Hispaniola, they asked the natives, by signs, where the gold was found which they wore as ornaments to the nose and ears, when the latter pointed to the banks of certain rivers and to the sands which were full of

* Minano. Dict.—The pistole was about six shillings of our coinage.

gold.* A certain cacique presented Columbus with a grain of natural gold, in shape like a pea, which weighed twenty ounces, and was sent to the King of Spain. In the opinion of the natives gold was of no more value than sand or shells; indeed, in several instances, the latter were more highly prized. The mines of *Buona Ventura* were extremely rich, as their name implies, when first worked. It was here that Garoz and Diaz found that extraordinary lump of gold, which is said to have weighed 3600 pesos, equal to 200 ounces. The lump was first noticed by an Indian woman, and purchased by Bobadilla, the governor, for a present to his royal master; but it went down, with the ship that bore it, to the bottom of the sea. But we must cease to cite these golden wonders, and strictly confine ourselves to pointing out the methods adopted to bring them to light.

The gold mines of Brazil may be cited as the most productive since the discovery of America. In the chain of mountains running parallel with the coast, and in the rivers which flow from it, especially in the affluents of the Francesco, are to be found the gold which has been an object of search for the last three hundred years. The mines of St. Jaragua produced immense treasures two centuries ago.† The formation of the rocks is similar to other auriferous regions,—granite, sometimes gniess, containing a portion of horneblende, with mica. The soil is red, and remarkably ferruginous. The gold lies, for the most part, in a stratum of rounded pebbles and gravel, called *cascalho*, immediately incumbent on the solid rock. In the valley, where there is water, occur frequent excavations, made by the gold-washers, to a considerable extent—some of them fifty or a hundred feet wide, and eighteen or twenty deep. On many of the hills, where water can be procured for washing, particles of gold are found in the soil, scarcely deeper than the roots of the grass. The mode of procuring the gold is simple, and may be easily explained. Suppose a loose gravel-like stratum of rounded quartzose pebbles and adventitious matter, incumbent on granite, and covered by earthy matter of variable thickness, where water of sufficiently high level can be ob-

* Du Perier, Voyages and Travels, 1708. † Maw's Brazil.

tained; the ground is then cut in steps, each twenty or thirty feet wide, two or three broad, and about one deep. Near the bottom a trench is cut, to the depth of two or three feet. On each step stand six or eight negroes, who, as the water flows gently from above, keep the earth continually in motion with shovels, until the whole is reduced to liquid mud and washed below. The particles of gold contained in the earth descend to the trench, when, by reason of their specific gravity, they quickly precipitate. Workmen are continually employed at the trench to remove the stones, and clear away the surface, this operation being greatly assisted by the current of water which falls into it. After five day's washing, the precipitation in the trench is carried to some convenient stream, to undergo a second clearance. For this purpose wooden bowls are provided, of a funnel shape, about two feet wide at the mouth, and five or six inches deep, call *gamellas*. Each workman, standing in the stream, takes into his bowl five or six pounds weight of the sediment, which generally consists of heavy matter, such as granular oxide of iron, pyrites, ferruginous quartz, &c., and often precious stones. They admit certain quantities of water into the bowls, which they move about so dexterously, that the precious metal, separating from the inferior and lighter substances, settles to the bottom and sides of the vessel. They then rinse their bowls in a large vessel of clean water, bearing the gold in it, and begin again. The washing of each bowlful occupies from five to eight or nine minutes; the gold produced is extremely variable in quantity, and in the size of its particles, some of which are so minute that they float, while others are found as large as peas, and not unfrequently much larger. This operation is superintended by overseers, as the result is of considerable importance. When the whole is finished, the gold is placed upon a brass pan over a slow fire to be dried, and at a convenient time is taken to the permutation office, where it is weighed, and a fifth reserved for the Prince.

In the district of Minas Geraes gold is abundantly scattered through the rocks of the mountains, the superincumbent soil, and the beds of the rivers, over a surface of many thousand square miles in extent, but generally in such minute particles

as to require a considerable degree of labour in collecting it: sometimes it is found in crystals, at others, in dendritical forms, but rarely in lumps, although a piece was picked up at Villa Rica which weighed sixteen pounds. It is said that this metal has frequently been found in little lumps under the roots of plants pulled out of the ground, being accidentally washed there by the rains. So universally indeed is gold disseminated over the central parts of Brazil, that a golden shower, more extensive and substantial than that which is said to have enriched the lap of Danaœ, might be supposed to have fallen upon them. In the mountains the precious metal is found in a red heavy loam, in beds of clay-slate, mica-slate, or in veins of quartz, and red ironstone. It usually assumes its most beautiful form in the large foliated iron mica-slate, and is also found in arsenical iron pyrites. But, the greatest of all treasures, yet the most neglected, is a very fertile soil covered with a luxuriant vegetation, and capable of producing every luxury and necessary of life, with a climate both temperate and agreeable. Here, however, as elsewhere, the *auri sacra fames* has extended a baneful influence over the infatuated inhabitants. Neglecting agricultural pursuits, their whole attention has till lately been drawn to the mines, a lottery in which the great prize generally remains in the wheel.* The condition of Villa Rica conveys an important moral. "It is quite evident," says this intelligent traveller, "from the deserted houses and general appearance of neglect, that there is no longer the population that it once contained (1825), nor the affluence which at one time prevailed in such an extraordinary degree. *No place* exhibits a more interesting spectacle to the moralist than this. A large mountain, thickly veined with gold, draws, on that account, a population of upwards of thirty thousand persons, who, in the course of sixty or seventy years, exhaust its precious riches. Poverty has now her full sway at Villa Rica; the streets swarm with mendicants, who, if diseased, confine themselves entirely to begging; but if in health, alternately try the boat in the streams, and the charity of the more affluent in the town." There are three

* Caldcleugh's Travels.

modes of collecting the scattered particles of gold; by scraping up the sediment of rivers, by splitting the rock with fire or powder, and carrying the fragments to a stamping-mill, and by turning streams of water into trenches made in loamy auriferous soils, along the declivities of the mountains. The process of amalgamation, without which the gold can never be properly separated from the specular ironstone, antimony, and arsenic, is, however, but ill understood and little practised.

In the environs of the village of Cocoes, the most numerous washings are established; and here the *pepitas*,* or lumps and scales of gold occur, mingled with the sands of rivers or the alluvial deposits on their banks. The greatest quantity was found between 1753 and 1763, since which it has gradually decreased. According to one authority,† the whole quantity collected between 1700 and 1820 amounted to a million and odd pounds weight avoirdupois, or about 14,800 lbs. annually, including one-fifth, which he thinks was smuggled out of the country. Between 1753 and 1763 it amounted annually to about 16,000 lbs., but between 1801 and 1829 only to 3540 lbs. The decrease of the produce was mainly owing to the best portions of the sand being exhausted, and the capital to work the veins on a regular system. British capital has been for the last quarter of a century employed in the mines of Gongo Soco, but the result appears anything but promising, if we may judge by the following returns, which present a decennial produce‡—

1831.	lb.	oz.	dwt.	1841.	lb.	oz.	dwt	1851.	lb.	oz.	dwt.
1st 6 months	1503	1	9	1st 6 months	410	3	7	1st 6 months	45	0	10
2d ,,	1228	9	8	2d ,,	520	2	9	2d ,,	61	1	1

The mines of Mexico are not productive of gold; nor are those of Peru. In Central America there are some streams which yield a fair quantity of the precious metal, but none of them afford a large profit for the labourer. Loyd, in his intelligent

* Pepitas—Pedacitos de oro puro, sin mezcla do otro metal, que se hallan en las minas.

Grains of pure gold without the mixture of other metal, which is found in the mines. Literally, pepita is seed.

† Eschwege, as quoted by Professor Ansted.

‡ Lectures on Gold—History and Statistics of Gold, by Robert Hunt, Esq.

notes on Panama,* observes that Vargua and Choco have yielded considerable quantities of gold, by washings in the streams, and of a very pure nature; there are but few other spots, according to the best authorities, worth working in that range of country.

Directing our attention to another quarter of the rich metalliferous regions of America, we observe nearly the same phenomenon. "Almost all the precipitous and broken grounds of Chili," writes an intelligent traveller,† "contain gold in greater or less quantities; the surface of the earth in which it is found is generally of a reddish colour and soft to the touch. The *lavaderos*, or places producing earth which yield gold by agitating it in water, are very common in Chili, but the indolence of the natives, and the want of labourers, suffer immense treasures to remain in the earth which might easily be obtained. Nine or ten leagues to the east of Coquimbo are the *lavaderos* of Andacoll, which produce gold of twenty-three carats fine, and are worked constantly with great profit when there is no scarcity of water." Coquimbo, Capiopo, and Guasco, contain the principal gold mines, the ore of which is called, by way of distinction, *ore capote*, as being the most valuable of any that has hitherto been discovered.‡ Garcilasso, in his History of Peru, observes, "that Pedro de Valdivia, who entered Chili after Almagro, opened mines of gold which were so rich that each Indian furnished from thirty to forty ducats daily, as, when only twelve or fifteen were employed, he obtained three or four hundred ducats a day. Valdivia received from his vassals an annual tribute of one hundred thousand pieces of gold." §

Other authorities might be cited, had we space, in confirmation of these views, and corroborating in the fullest degree, the great plenty of gold throughout the mountain ranges of Chili. The mining for the precious metal, however, produces the same economical results as elsewhere—the wandering, unsettled, and reckless mode of life of those who are engaged in the pursuit, and their consequent immoral and degraded

* Royal Geographical Society.
† Frazier's Voyage, vol. i.
‡ American Gazetteer, art. Chili.
§ Sanson's Geography, art. Chili.

condition. Speaking of the yield of the mines, a distinguished authority observes, "that in many places the miners are allured at first with appearances of great riches, but some find the ore entirely fail, or in so small quantities as not to repay them for their labour. The metallurgists of Chili call this kind of wandering mine *bolson*; the same name is also applied to the ramifications, which in general are circular, and to the richest veins, where the ore is found lodged in heaps and cavities." *

The matrix of the gold is very variable, and it may be said that there is no kind of stone or rock but what serves it for that purpose. It is to be seen everywhere, either in small grains, or brilliant spangles, under singular forms or in irregular masses, that may be cut by the chisel. The most usual matrix is a very brittle red claystone. The *salbanda*, or exterior covering of the veins, called by miners *caxas*, is as variable as the matrix; it is sometimes of spar or quartz; at others it consists chiefly of flint, marble or hornblend.† The washing is performed in the following manner:—the earth or sand, containing particles of gold, is put into a vessel of wood or horn, called *porura*, which is placed in a running stream, and constantly shaken; by this means the sand, which contains no metallic particles, being lighter, is thrown over the top, and the more weighty, or the gold, remains at the bottom. This operation is necessary to be repeated several times, in order to carry off all the ferruginous earth, which is always united with the gold.

The miners, according to the authority just cited, are expert in mining, and in the art of assaying and refining metals; but their knowledge is wholly practical, and they are entirely ignorant of the theory, or the real principles of the art. In general they are a bold, enterprising, and prodigal class of men. Familiarized to the sight of precious metals, they learn to disregard them, and attach but little value to money. They are extravagant in their expenses, and passionately addicted to gaming, in which they pass almost all their leisure hours. Nothing is more abhorrent to them than frugality; and when-

* History of Chili, by Abbé Don J. Ignatius Molina. † Idem.

ever they find one of their companions, who has amassed a sum of money by his economy, they leave no means untried to strip him of it, observing, that avarice is a vice peculiarly degrading to a miner; and so addicted are they to inebriety, that those who, on first joining them, are remarkable for their abstemiousness, are soon led, from the influence of example, to participate in the general intemperance. From these causes none of them acquire property, and they generally die in the greatest poverty and distress, while the profits of their labours are wholly absorbed by those who supply them with provisions and liquor.

Moorcroft noticed in the district of Kolen,* at eight days journey from Yungee-Kishlak, a country which abounds with gold in grains and masses. The Emperor of China employs from five hundred to a thousand men constantly in collecting it. The unfortunate Burnes, also, found the fishermen in the Indus and Cabool rivers, washing the sand for gold; and he remarks that some of the smaller streams, such as the Swan and Hunoo, yield more gold than the Indus. The precious metal has also been found at the foot of the Neelgherrie Mountains, in great purity, but not as yet in great abundance.

Gold, instead of being a blessing to a country in which it abounds, appears to contain the very elements of debasement and degradation. There is scarcely an exception to this widely general rule. In the remote provinces of Tartary and Thibet it produces the same result, as in Europe or America. "It may be concluded," says a highly intelligent traveller,† "that this country (Thibet) is perhaps the richest, and, at the same time, the poorest in the world; rich in gold and silver, poor in all that constitutes the well-being of the masses. The gold and silver collected by the people is absorbed by the great people, and especially by the Lamaseries, those immense reservoirs into which flow all the wealth of these vast regions. The Lamas, invested with the major part of the currency, by the voluntary directions of the faithful, centuple their fortunes by usury that puts even Chinese knavery to the blush. Money

* Geographical Society.

† Huc's Travels in Tartary, Thibet, and China, vol. ii. p. 147.

being thus accumulated, and the necessaries of life being only procurable at a very high price, it results that a great proportion of the population is constantly plunged in the most frightful situation. Thibet, so poor in agricultural and manufacturing products, is rich, beyond all imagination, in metals. Gold and silver are collected there so readily, that the common shepherds have become acquainted with the art of purifying those metals. You often see them in the ravines, or in the hollows of the mountains, seated round a fire of argols, amusing themselves with purifying in a rude crucible the gold-dust they have found while tending their herds." The result of this abundance of the precious metals is, that specie is of low value, and that, consequently, goods always maintain a high price.

In a similar range of country, and not remotely distant from Thibet, we have presented the great Ural chain, with its rich auriferous contents. In the notice of these mountains by an intelligent traveller,* we find the following remarks:—"The sand, containing small particles of gold, occurs along the eastern and western declivity of the Ural range; but contains less gold in the latter, and in fewer places. On the Siberian side, the sand from which the gold is extracted contains about one and a half, or two zolotnick of gold in a pood, or from 1-2280th to 1-1920th; that which contains less is at present not worked. Mr. Rose says that even sand containing 1-7680th of gold can still be washed with profit. The expenses in washing gold containing between 1-2280th and 1-1920th of gold, amount commonly to two-fifths of its net produce. Sometimes sand is found, of which 1-600th, and even 1-300th is gold; it amounts to between 2 and 11 parts in 100. The first establishment for working this sand was made in 1814 at Berezowsk, near Yekaterinburg, and since then they have increased. More than two-thirds of the gold is the washings of the sands."

In Carolina and Georgia (North America) gold has been found in considerable quantities, but the pursuit is not followed up with that spirit which would indicate that it is very profitable. The Carolina and Georgia mines, according to Professor Ansted, have yielded masses of gold of considerable size, one

* Travels to the Ural Mountains, by M. Wittich.

having been found weighing 28 lbs. avoirdupois. The average annual quantity for the last three years is something less than 3000 lbs. weight, or in value £175,000. The mines are on the Appalachian range, particularly on the eastern slope from Maine to Alabama, having a north-east and south-west course.

In a succeeding chapter we shall give a full and detailed account of the gold regions of California and Australia, which the preceding summary will probably enable the reader to more fully appreciate.

CHAPTER IV.

GENERAL CHARACTER OF GOLD — VARIATIONS IN VALUE — PECULIAR AFFECTION FOR IT AMONG MANKIND.

THE foundations on which is built up the power of the precious metals in human affairs, are pretty deeply seated in the mind. Those who delight in tracing final causes, and in meditating on particular instances of design, can hardly mistake the evidence of wisdom observable in the arrangement regarding the precious metals, and will be struck with its peculiar adaptation to the requirements of man as a progressive being, whether struggling into society or far advanced in the career of civilization.

That the precious metals were designed as instruments in the production of human civilization, may be inferred from the peculiar affection which man invariably entertains for them as compared to other commodities. All objects produced by labour are, more or less, objects of human desire, as they are supposed to contribute to human enjoyment; but the desire for these several objects is by no means uniform and unvarying, as daily experience proves; on the contrary, it is frequently capricious, partial, and ununiform, and is apt to vary according to time, place, and circumstance. A certain quantity of each will generally satisfy human wants, and more is seldom

used, either by individuals or by communities; but gold and silver must be ranked as exceptional objects, as the desire for them is uniform, constant, and inappeasable, at least wherever man has made any progress in civilization. These precious metals, therefore, have always held the highest place—the place of honour—in his affections, and no assignable quantity in possession, like other commodities, seems, in the slightest degree, to endanger their position.

The primary utility of gold was, most probably, for the manufacture of rude utensils, and for ornaments, so that the desire to possess it may be measured by the uses to which it was applied. The rude and untutored Indian only valued gold according to his limited wants; he made ornaments of it occasionally for his nose or for his ears, or shaped it into fish-hooks or other ordinary, but useful, objects; therefore, the early voyagers to the country of the Indians easily obtained it for the most insignificant trifles. This was the first stage of man's affection for the precious metal.

At a period long antecedent to the preceding, when civilization had progressed considerably amongst men, we find gold, or rather its cognate metal in value, silver, in its second stage of utility. It had then advanced to become the standard of value, and an instrument of exchange, a test by which all other commodities were estimated. The peculiar qualities of the precious metals naturally pointed them out for this especial service; they were more durable, more capable of divisibility without any appreciable loss, and, above all, were more easily identified as to quality, than any other known substance.

The experience of the second stage of utility must have materially augmented man's preceding affection for gold and silver; and, in proportion as practical wisdom extended his power over a greater number of desirable objects, did his love for those precious metals increase, for experience quickly taught him that they could be exchanged for everything he desired to enjoy. We have seen that Abraham gave Ephron a piece of silver as the price of his wife's burial-place, simply because the latter would not have accepted so many head of cattle in payment, so at least it may be inferred, for cattle were

not so readily exchanged as a definite quantity of the precious metal, either in his own country or in that where Abraham himself had derived the custom. Ephron, as a man of substance in those days, must have journeyed to Egypt, like the patriarch, and was evidently versed in the sale and transfer of property, therefore took in payment the most valuable commodity that it was then customary to tender, for his piece of land.

The gradual extension of man's power over the material world at length completed the last stage in the complex formation of his affection for gold. That precious metal was clearly not the end of his desires, but the means to gratify those desires; for who does not perceive that under the thin veil of a mere love for gold—in itself far less useful than iron—are scarcely concealed the various and multiplied affections of the human heart for the several objects around it? Without the instrumentality of the precious metals the affections of man could only be gratified to a limited extent, nor could manufactures and commerce have extended themselves beyond a very limited degree. The desire for gold, therefore, may be termed *directly* as civilization, and *inversely* as the opposite state of existence prevails. The inference from these remarks would lead to the conclusion that there is no limit to the desire for gold. Nor is there; for experience proves that there is no assignable limit to human desires; that, as one inconvenience is removed others present themselves, which before had never been thought of; that the passion for wealth expands with the gratification of existing wants, and, if not absolutely infinite, may at least be termed indefinite: that, in short, man's desire is capable of extending itself far beyond the bounds which even imagination can assign as the limit of human understanding. No one can entertain any reasonable doubt as to the general truth of these propositions, or would venture to maintain that, were the aggregate incomes of all persons increased tenfold, they would find any great difficulty in disposing of them.

> "Nec Crœsi fortuna unquam, nec Persica regna,
> Sufficient animo,"

is a grave truth, which has been acknowledged by philosophy,

and confirmed by the experience of mankind, and just as applicable in these days as it was when the Roman satirist levelled it against his own.

In order, however, to fully appreciate the value and influence of the precious metals, we must go back to that distant time when first

> ——— "The gorgeous east with richest hand
> Showered on her kings barbaric pearl and gold;"

or, in more sober language, when commerce and manufactures caused gold and silver to flow into Western Asia with such profusion that the merchant-prince of that age converted the one into common "targets," and made the other "to be in Jerusalem as stones."* The quantity of the precious metals which Solomon accumulated is almost beyond conception, were it not well attested both by divine and by profane testimony, which historical research has so conclusively furnished. *There* is revealed to us the great transit-trade of Western Asia, the centre of which was in the heart of that Jewish king's dominions, and by following the land and sea routes which commerce then took, we can easily account for his extraordinary accumulation of wealth. While the products of India found their way to the western world, those of Egypt and Ethiopia were moving in an opposite direction,—both naturally seeking a convenient point for exchange. The inter-agents of that exchange necessarily acquired wealth, and ultimately became the arbiters and disposers of all those products. Solomon, from his central position between the Red Sea and the Mediterranean, with the Phenicians and their rich manufactures on the one hand, and with his maritime command on the other, naturally became the point around which a great portion of the wealth of that age concentrated. There were the horses, the fine linen, and the rich products of the looms of Egypt, annually seeking a market in the dominions of the Syrian prince, and there the myrrh and frankincense of Arabia for the same purpose; at a distance which his ships could reach were the ivory, the peacocks, and the spices of India, besides the slaves and the gold-dust of Ethiopia; in an opposite direc-

* 1 Kings, ch. 10.

tion, with a new world at their command for trading purposes, were the most skilled mariners of Europe, and the most ingenious manufacturers in the world. There was Solomon, then, in the centre of the great moving elements of the age, and, being especially endowed with worldly wisdom, he naturally turned them to good account, at least so far as his own personal grandeur was concerned. So long, therefore, as he could keep the great pulse of the world under his finger, and influence all the great arteries of communication, he could not fail to accumulate riches in one form or another, and the mere enumeration of his wealth is sufficient to attest his ability in that respect.

The "barbaric pearl and gold," however, is generally the leading feature in the riches and splendour of an Asiatic monarch, and, with a slight change of name or so, the description of Solomon's court and palace might be applied to that of Nadir Shah, or, to come nearer to our own time, to that of Tippoo Saib or Surrajah Dowla. With slight exceptions, the reading of the one is almost the reading of the other. There are three peculiar objects which occupy invariably the leading positions in the *tableau* of an oriental prince, namely, gold, concubines, and precious stones. The first and last vary according to the locality in which the prince may chance to reign, but the intermediate object is pretty uniform throughout the eastern hemisphere. Take at random, for example, any half-dozen passages from the Old Testament, and it will be difficult to avoid stumbling upon the term gold: in fact, it seems as familiar to the ear as "crocodile," when reading of the banks of the Nile, or "elephant," when perusing the descriptions of our Indian nabobs. "Then halt thou lay up gold as dust, and the gold of Ophir as the stones," exclaims Job; and when the queen of Sheba went up to prove Solomon with hard questions at Jerusalem, say the Chronicles, "She was escorted with a very great company, and camels that bore spices, and *gold in abundance.*" In fact, the gold which Solomon acquired, by one means or another, became so abundant in his coffers, that he absolutely used it, as we have already remarked, for the most ordinary purposes.

We must bear in mind, however, that the custom of Asiatic sovereigns was the same in the time of Solomon as at the present day; so, indeed, was that of the great mass of the community over whom they held sway. Both in outline and in internal detail, the habits of the east seem to have been preserved with the most rigid minuteness, and to have resisted change with almost unbroken uniformity. To amass enormous treasures, for instance, was as common in the days of Solomon as at the present time, which simply implies that the reigning prince was absolute master of the wealth, and almost of the will, of his subjects. Asiatic princes, in all ages, have been ignorant of that invaluable principle of European policy, under which it is found less profitable to hoard up money than to leave it in circulation. It is not, therefore, astonishing that the accumulation of the precious metals by Solomon should be very large, as the transit-trade alone, irrespective of the tributes of other nations, must have yielded him immense sums. We have the testimony, likewise, of profane writers, of the then general profusion of gold and silver in Arabia. The precious metals must therefore have been of much less value than at the present time; and their relation to each other experienced such singular changes, that modern times furnish no parallel wherewith to institute a comparison. Relying upon profane writers, who state that the precious metals were more abundant in Arabia than in any other known country, we have scarcely an incident in history that approximates to it, except the quantity of gold and silver found by the Spaniards in Mexico and Peru. Diodorous mentions a river in Debæ (*Hedjaz*) that abounded in small lumps of most beautiful gold. Arrian, Strabo, and Agatharchides describe, in glowing terms, the wealth of the settled Arabians in precious metals. The pillars of their houses, says one of these authorities, were resplendent with gold and silver; they had, also, vessels and domestic utensils of the same metal; and their persons were profusely adorned with various ornaments, composed of the same materials. It is even said that gold was in such plenty that it was but thrice the value of brass, and only twice that of iron, while silver was regarded as ten times more valuable than gold.

Of the abundance of the precious metals, therefore, we have the clearest and most indubitable proof, but of the relative value of the one with the other, we have little more than conjecture to enlighten us. Silver appears to have been the standard of value in Egypt, and was most likely adopted by the Israelites, as we find the common people amongst them, upon whom a poll-tax was levied for the construction of the tabernacle, paying their contributions in that metal; while, on the contrary, the richer class, who could afford gold ear-rings, paid theirs in the most precious metal, but not in the shape of money, like their inferiors.

The gold contributed to the structure of the tabernacle exceeded the silver by about four to one,* therefore it may be inferred that the payments of the more humble and numerous class of the Israelites must have been in small coins, or pieces of metal, such as they would receive in the ordinary payment for their labour. Here we have the rich ornaments of gold on the one hand, and silver in the shape of money on the other, which throws considerable light upon the separate uses of those two metals, but very little as to their relative value. This brings us to another point of considerable importance as to the relation of the two metals.

Gold appears to have been much earlier recognized among the special objects of value than silver, although silver appears to have performed the actual functions of money, in the first instance. Joseph was sold by his brethren *for twenty pieces of silver*, to a caravan of Midianitish merchants, at the very time that these merchants were journeying towards Egypt to exchange their produce for gold-dust amongst other commodities, which they disposed of at a large profit in their own country. Again, we find at a subsequent period that the brethren of Joseph brought "silver in their sacks' mouths" to

* A writer of no mean authority has estimated the cost of the Tabernacle at upwards of £200,000 of our money, but assumes that the silver should be valued at 5s. per ounce, and the gold at £4, which gives the relation at present existing between the two metals. It is not stated upon what authority this calculation is made, therefore, we presume, it must be purely conjectural, especially as collateral circumstances seem to weigh against it. *Vide* Pictorial Bible, notes on Exodus, ch. 25.

purchase corn, which clearly indicates that silver, and not gold, was the ordinary standard of value in that age. Whence came this silver? Not from Nubia and Ethiopia, which produced gold and copper, but no silver, or the sources whence it was derived would have been apparent at the present day.* The weight of historic testimony inclines to Spain as the original seat, the rich and prolific source for the supply of silver, at the period to which we allude. The mines of Laurion had not then been discovered, for the Greeks were but little better than roving pirates, who preyed upon the richer and more settled industry of their neighbours. Heeren† has satisfactorily cleared up this question. "When the first Phenicians," observes that profound historian, "visited Spain, it is said they found silver there in such abundance, that they not only freighted their ships with it to the water's edge, but made their common utensils, anchors not excepted, of this metal." Thus laden, they returned back to their own country, and, being a maritime people, they naturally distributed this precious metal in profitable exchange throughout the great trading marts of the world. It was, doubtless, in this manner that silver found its way into Egypt, and into Arabia; and, upon the first introduction of that metal into the latter country, it was so highly esteemed from its natural beauty, that it was valued at nine times a higher rate than gold, according to the authority we have just cited. The Arabians, in fact, were familiar with gold, and knew from experience its precise value, but silver was new to them, and from its rarity naturally commanded a higher rate of exchange; but when the Phenicians poured large quantities of that metal into Arabia, it soon began to decline, and ultimately settled down at the point which its supply, when measured with that of gold, would naturally determine.

There was no large accumulation of the precious metals in Greece for nearly 300 years after Solomon's reign, for history contains several scattered remarks of their great scarcity down

* Mr. Jacob, generally an invaluable authority, remarks that these countries furnished a large share of the gold and silver accumulated before the Christian era, but cites no writer of weight in support of his observation as regards silver. *Vide* Precious Metals, vol. i.

† Historical Researches, Asiatic Nations, vol. i. p. 328.

to the time of Philip, which forms a striking contrast with their abundance in Egypt and Judea at the same period. At the siege of Troy, about a century after the time of Solomon, though some of the chiefs had ornaments about their arms of gold and silver, the use of these metals was beyond the reach of their followers. Neither Homer nor Hesiod speak of gold or silver as money, but express the value of commodities by a certain number of sheep or oxen. The wealth of individuals was measured by the number of their flocks and herds, the primitive standard of the Asiatic plains, or by other material objects, much inferior to the precious metals. Trade was carried on by barter, and the Greeks of that age had not advanced to a metallic standard of value in their transactions.*

The rapturous exclamation of Xenophon, that "Athens had received a gift from heaven," upon the discovery of the silver mines of Laurion, marks an era in the monetary system of the ancients. Here we first begin to descry the relative value of gold and silver, and the important part which these metals performed in the affairs of the world. The produce of the silver mines enabled Themistocles to found the naval force of his country; and nothing so much promoted the trade of Athens as the purity of her silver coin, which was everywhere received as a medium of exchange.† Greece had now emerged from her piratical condition, and had taken her station among the great trading communities of the age, for she coined money, and presented her neighbours with a standard of value by which they could regulate their mutual exchanges, the earliest indication of an honest and thriving position in the world. The Athenians, however, confined themselves to one single species as a standard issue. Silver coins, descending from the tetradrachm to the quarter obol, were the only legal currency at Athens. The gold coins of foreign countries, being much employed in commerce, were received in payment at the treasury, and in the larger dealings of the home trade; but they appear to have circulated according to their intrinsic value,

* "Each, in exchange, proportion'd treasures gave:
Some, brass or iron; some, an ox or slave."—*Il.* 7. v. 560.

† Bœckh, Public Economy of Athens.

when measured by the Athenian currency, which was then established upon something like an equitable basis.

The confusion and difficulty, however, which must naturally arise in a commercial state, where money of different values are in constant circulation, began to exhibit itself at a very early period among the Athenians. Xenophon saw the difficulty at once, and with the intuitive perception of a statesman. We could almost imagine that he was speaking in this age, and not upwards of two thousand years ago, so clearly did he comprehend the economical bearings of the question. "If any one," says that enlightened Greek, "should tell me that gold is no less serviceable than silver, so far I do not contradict him; but this I know, that *if gold becomes abundant, it sinks in its value, and raises the value of silver.*" * The relative value of gold and silver, at that time, appears to have been in the proportion of ten to one. The value of gold, however, rose, partly on account of the proportionally larger increase of silver, until it arrived at ratios similar to those of modern Europe, namely, from 13½ to 15 to 1.

The earliest gold coin, we believe, is the *daric*, which commonly circulated amongst the Greeks and in Asia Minor, although some authorities incline to give the precedence to the *stater*, which was coined by Crœsus, King of Lydia. Greece, at that period, was poor in gold. Subsequently, however, the golden statue of Victory at Athens was coined into money, probably upon some urgent occasion, which Aristophanes designated as wretched pieces of copper, from their being much debased with that metal. The statue itself most likely had nothing more than a coating of gold upon an inferior metal, a practice in the fine arts not confined to the Greeks, but sometimes practised by their instructors, the Egyptians and Assyrians. Gold was also coined by the petty rulers of the Greek isles, as well as those of Sicily; by Gelo, 491 years before Christ; by Hiero, 478 A.C.; and by Dionysius 404 years before that era. There were no gold coins, however, in Greece of any consequence, till Philip of Macedon worked the mines of Thrace, which paved his way to the conquest of that country. The

* Xeno: περι προσοδ. iv. 10.

saying of Philip that a donkey and hamper of gold could most effectually silence the thunder of the Grecian orators, was a true but painful comment upon the spirit and patriotism of the time.* Demosthenes affords an insight into the relative value of the precious metals when he remarks that 120 Cyzecenic staters passed in the Bosphorus for 3360 attic drachmas, 1 for 28, not, probably, because their weight was greater than the drachmas, but because the value of gold was then higher in that country, being to silver in the ratio of 14 to 1.†

There appear, then, four modes of acquiring the precious metals—first, by labouring in mines or among the sands of rivers; secondly, by producing commodities which are exchangeable with those who possess the metals; thirdly, by moving commodities from one part of the world to another; and, fourthly, by violence or conquest. We have now only to consider the last mode of acquisition as an element of disturbance, or of distribution.

Conquest has occasionally diverted the precious metals from their ordinary channels for centuries together; it has sometimes destroyed those channels altogether, and dried up the very sources of supply. One of the earliest and most memorable instances of this kind is the campaign of Alexander the Great. The quantity of the precious metals which the followers of that conqueror brought with them, after their return from the east, must have been immense. Gold was everywhere in abundance, and gradually diffused itself throughout the eastern world, until its relative value to silver receded from 14 to 10 to 1. The ravages of the Parthians in the later times of the Roman Empire, and the final conquest of Asia Minor by the Mahommedans, which completely exhausted the countries lying between the Euphrates and the Mediterranean, once so rich in the possession of gold, are two more instances of a similar kind, and finally, the conquests of the barbarians in the fifth century, which were marked not only by a displacement of the precious

* Cardwell on Greek and Roman Coins, *Lec.* 1.

† "The gold stater of Athens, which was worth twenty drachms in antiquity, is at present valued at thirty-two drachms."—*Lectures on Ancient History*, Niebhur. Taylor & Walton.

metals, but, in some instances, with the absolute destruction of the mines.

We have remarked in the preceding chapter that the great bulk of gold and silver in circulation, when Rome arrived at the apex of power, naturally found its way to that imperial city; and, from a variety of causes which affected their value at different periods, their relative fluctuations present some singular features. At the payment of the Etolians, in the year of the city of Rome 564, when they were allowed to pay one-third in gold, we learn that the proportion prescribed between the two metals was 10 to 1; but a few years preceding, in the year 547, the ratio of gold and silver was as 17 1-7th to 1, which soon afterwards narrowed itself to 13 5-7ths to 1. In the time of Julius Cæsar, on account of the large influx of gold from Gaul, the ratio fell as low as about 9 to 1; and Polybius relates, that in consequence of the sudden supplies from the mines of Aquilea, the value of gold fell one-third. However, after the conquest of Sicily, which yielded a large booty of silver, the relation of the two metals was as 17 to 1; and as the empire approached its decrepitude, a sensible decrease in the quantity of gold began to show itself, especially under Valentinian, when its relative value to silver was as $14\frac{1}{2}$ to 1. Under Honorius the relation between the two metals was still wider; and in the year 422 it appears to have attained its maximum, when it stood as 18 to 1. In short, nearly throughout the whole period of Roman supremacy and decline, the precious metals were subject to violent oscillations, for their delicate and susceptible nature cannot endure an abrupt and sudden change, and the equilibrium of their values can only be maintained under the influence of a healthy and steadily-diffused industry.

Although the wealth of the world, however, might be said to flow into the Roman treasury, at the commencement of the empire, there was generally a great scarcity of the precious metals, as is proved by the high and fluctuating rate of interest which so frequently prevailed. From the very nature of things this must have been the case. Rome imported almost everything she required, so that there was a constant

drain upon her resources, and, had not the remittances of tribute annually replenished her with the precious metals, she could have scarcely retained a single piece of gold or silver in circulation. The Roman bankers, who farmed the distant provinces, were the possessors of the current cash of the state, and lent it out to those who required it, and who were sufficiently stable to obtain credit. These *argentarii* transacted business in a similar manner to the bankers of the present day; they paid the written orders of those who had money in their hands, and opened regular debtor and creditor accounts with their different clients, as though they had been located like a *shroff* in Bombay, or a wealthy firm in Lombard Street. The *tabulæ accepti et expensi*, were the transferred sums from the credit of one to that of another, when payment was not required in coin, just as such transfers are made at the present day by Torloni in modern Rome, or by the banks in Glasgow or Edinburgh. These bankers, in fact, were called into existence by the very scarcity of the precious metals, for the transactions of commerce, as well as those of the state, were, in great part, liquidated by drafts upon their different agents. The Roman bankers had their agents at Alexandria, at Antioch, in Spain and in Gaul, so that a letter of credit, permitting the term, could be made available as currency, at every point of importance throughout the empire, and the necessity of providing the precious metals for that purpose obviated. We have it on record, for instance, that the *Vectigal* of Asia was farmed by a company of Roman knights, and that the latter were deeply indebted to the bankers of Rome. Previous to the conquest of Asia by Pompey, the annual remittance amounted to nearly two millions of our money, and this must have been but a small portion of the sum exacted from the Asiatics by the Roman knights, as we read of the former entreating Julius Cæsar to commute the annual tribute to four millions sterling. In the beginning of the Mithridatic war, however, the failure of remittances from these knights ruined the Roman bankers; and towards its close, some twenty years later, we find Cicero urging the people to entrust the management of the war to his friend, in order that the apprehended failure of the remittances might be averted. Roman

credit, exclaims the orator, depends entirely on the Asiatic remittances, and if it is not sustained the Forum will be again insolvent.* So that the failure of four millions annual remittance to Rome endangered the position of the Roman bankers, and was sufficient to shake the monetary system of the empire to its very base. This may be accounted for, we apprehend, on the supposition that the precious metals were occasionally very scarce. Another circumstance seems to confirm this view of the case. When Julius Cæsar entered Rome, he is said to have seized the treasury, and to have plundered right and left, in order to acquire means for the accomplishment of his political designs;† and by circulating the fruits of his plunder, we learn that the value of gold and silver was altered relatively from 10 to 8 or $7\frac{1}{2}$ to 1. If the few millions which Cæsar could lay hands on had the effect described, it is reasonable to infer that the amount of the precious metals must have been comparatively small and limited to few hands, otherwise so great and sudden an alteration in their relative values could not have ensued. Wherever the precious metals are largely accumulated, or pretty generally diffused, a sudden rise or fall in value is seldom effected either by the subtraction or addition of any given sum, however relatively large it may be; but, on the contrary, where the amount operated upon is comparatively small, and confined to a limited space, the alleged effect is almost sure to ensue.

Fluctuations, therefore, in the interest of money, especially when they partake of a violent and changing nature, are pretty sure indications of a scarcity of the precious metals; the phenomena are alike observable under commercial as under military regimes, although they are more frequently remarked in the latter, and are more violent in their nature. Pliny, the younger, observes that the ordinary rate of interest was twelve per cent.,

* Nam cæterarum provinciarum Vectigalia, Quirites, tanta sunt, ut iis ad ipsas provincias tutandas vix contenti esse possimus. Asia vero tam opima est et fertilis. . . . . itaque, hæc fides atque hæc ratio pecuniarum quæ in foro versatur, implicita est cum illis pecunis Asiaticis, et cohæret."—*Cicero pro Lege Manilea.*

† ——— "tristi spoliantur templa rapina,
Pauperiorque fuit tunc premium Cæsare Roma."—*Lucan Phars.*, l. 3.

but previous to the period of which he speaks it was much higher, for Cicero complains that one per cent. per month, and frequently more, had the effect of drawing all the money out of the hands of the many into those of the few; and to such an extent had this high rate of interest operated, that but little of the precious metals was left amongst the general people. Out of one million and a quarter of the inhabitants of the city and suburbs of Rome, the orator remarks that there were scarcely 1000 persons who possessed property at all.* Of the general scarcity of money, or rather precious metals, we have another instance in the policy of Augustus, as regards loans and rates of interest. The enormous amounts exacted for the use of money were found so oppressive, that that Prince, in order to check the evil, converted the confiscated property of criminals into a fund from which sums were lent, for stipulated periods, free of interest, to those who could give security for double the amount, and a similar measure was adopted by several succeeding emperors.† A similar measure was adopted by Tiberius, which saved public credit, and rescued several Roman families from destruction, when their credit was destroyed, and every prospect had vanished.‡ The emperor opened a fund of one hundred thousand great sesterces, as a public loan for three years, free from interest, on condition that the borrower, for the security of the state, should mortgage lands of double the value. "The want of current money," says the historian, "brought on this scene of distress." The interest of money at Rome, according to Brotier, was then forty-eight per cent., a clear proof that the precious metals must have been exceedingly scarce, for they were the general media of discharging obligations. The conduct of Brutus, a few years preceding this circumstance, also throws considerable light upon the rate of interest, and of loans and money in different parts of the then republic. That Roman had lent two million five hundred thousand sesterces to the city of Salamis in Cyprus at forty-eight per cent., and, as the latter was unable to pay upon demand, history informs us that Brutus surrounded the Senate

* Cic. Of. 2, 21, and Plin. Epist. l. 7.
† Suetonius, Vit. Aug.
‡ Tacitus An : l. 6., c. 17.

House with troops, under Scaptius, and kept the senators besieged until he had actually starved five of them to death. Of course the Roman patriot was paid.

The bare enumeration of these facts, must naturally lead to the conclusion that the amount of the precious metals was comparatively small, as compared to the general wealth of the Romans, and that they must have been thinly diffused through the different parts of the empire, although the riches of individuals were enormous, and almost beyond modern conception.

Yet, in the face of these varied data, which, to our simple view, are corroborative of the general scarcity of the precious metals under the rule of the Empire, Mr. Jacob* has started an hypothesis, as to their quantity, which points in an exactly opposite direction. That generally great authority assumes the quantity of metallic wealth to be, in the fourteenth year of the Empire, three hundred and fifty-eight millions of pounds sterling, which, in the course of little less than eight hundred years, dwindled down to thirty-three millions odd. Had there been that sum in existence at the period spoken of, the Romans would have possessed an amount of the precious metals nearly equal to the aggregate quantity at present in circulation, which, it is reasonable to assume, is the result of one thousand times the labour, and represents more than one thousand times the wealth the Romans ever could possibly possess, wide-spread and comprehensive as were the limits of their dominions. This calculation rests, be it remarked, upon the most slender basis; nor should we have alluded to it, did not the errors of distinguished authorities frequently tend to mislead enquirers of a different order of mind.†

Mr. Hunt, in his contribution of "The History and Statistics of Gold," has given us an *omnium gatherum* of the scattered accounts of the precious metals, whether in ancient or modern

* Precious Metals, vol. i.

† In a publication just put forth under the auspices of the *Government School of Mines and of the Science applied to the Arts*," entitled "*Lectures on Gold*," for the instruction of emigrants about to proceed to Australia—a work in many respects well worthy of perusal, as containing a series of facts, suggestions, and views, of one or two of the leading minds of the age, in relation to the subject upon which it treats—there appears an example in point.

writers, with less discrimination than we might have expected from so able an author. We have, for instance, the statement of Appian, that Ptolemy Philadelphus had gathered in his treasury no less a sum than £180,000,000 sterling; and to add to the marvellous nature of the fact, we are informed that this enormous treasure was obtained by armed—not regular troops —*by organized bands of robbers!* Organized bands of robbers filling the treasury of the state with booty, which they chanced to plunder!! Again, we are informed that Pythœus ordered four-fifths of his subjects to abstain from digging for gold, as his wife was ashamed at his avarice, which sacrificed so many of their lives. Why not leave the real fact alone, which is justly stated—namely, that "through the want of food he was induced to order that one-fifth, instead of the whole, should in future be compelled to devote themselves to those operations." Then we have the piles of figures to which we have alluded in the text, with the profound remark that they "are a curious and instructive compilation." The curiosity of the compilation we admit, but the instruction it is likely to afford we must leave to more sagacious intellects than we have any pretence to. The *Quarterly Review* (No. 85) elegantly remarks upon the plastic genius of Heeren, in the course of a profound criticism of his works—"that he united the laborious erudition of his countrymen with that animating spirit of real genius which disposes into harmonious order, and quickens into life that which, in meaner hands, lies in dull and heavy masses of unintelligible, or at least, unattractive learning."

It is, however, necessary to remark that there was a pretty steady demand for the precious metals for manufacturing purposes, both in the time of the Greeks and the Romans, especially among the former, which steadied in some measure the violent oscillations to which they were periodically subject. Ornaments for the person, works of art, particularly for sacred offerings,*

* The vessels found in Pompeii do not seem to strengthen the fact of the Romans using a great deal of gold for ordinary purposes, as they are either made of brass or of bronze; nevertheless, we have the testimony of Roman writers to that effect, who could not be mistaken. Sallust remarks of the

and the costly utensils of the wealthy portion of the community, besides the ordinary demands of trade and commerce, had a tendency to keep the value of gold and silver in some measure steady. The pay of troops, also, was made in gold, so that large quantities must have been in constant demand, which prevented the ratio between the metals from diverging so eccentrically as it otherwise would have done.

Under the Mahommedan influence gold experienced a strange revolution in relation to its sister-metal, silver. That prophet prohibited rings of gold, and only permitted either sex to wear silver ornaments. In the end, however, he allowed the fair sex to resume their gold ornaments, for they were too resisting even for a prophet. "Whosoever," says Mohammed, "likes to put into the nose or ear of his friend a ring of hell-fire, tell him to put on a *gold* ring; and he who wishes to put on his neck a chain of hell-fire, tell him to put on a chain of *gold*; and he who wishes to put on rings to his friend's wrists of hell-fire, tell him to put on golden ones: wherefore be it on you to make your ornaments of silver." We will venture to suggest two reasons there were for these prohibitions:—First, the prophet wished to aim a blow at the ordinary pride of the rich Arabs, in order to raise himself in the estimation of his poor and fanatical followers; and, secondly, by melting down the precious metals, thus easily acquired, he could the more effectually carry out his schemes of religious reformation. To have prohibited silver would have been venturing too far against the habits of his countrymen, as ornaments of one kind or other are dearly cherished by every class of the Arabs, and indeed by all Asiatics. However, the prohibited gold of the prophet found its way into Europe, and proved a timely supply against the deficiency which hoarding, and the disturbed state of affairs, had then rendered so considerable.

The discovery of America, and the remarkable circumstances which sprung out of that event, wrought a great change in the value of the precious metals. The value of gold had hitherto

wealthier Romans of his time, "that the bits of their horses' bridles and the collars on their necks were of gold, and that the covering of their backs were adorned with gold and purple."—*Sal. Cæs.* 43.

oscillated between the ratios of 10 and 12 to 1, in relation to silver, for several centuries; but the sudden influx of both metals, upon the discovery of the rich mines of Mexico and Peru, very soon altered their relative values. It is a singular fact that the first importation of the precious metals into Europe had a direct tendency to lower the value of gold and advance that of silver, for the quantity of the former, when the Spaniards first discovered the country, was much greater than that of the latter: the one they found in abundance, either in possession of the natives, which they readily exchanged for the merest trifles, or easily procurable in the sands of the rivers,—while the other could only be obtained by labour and some degree of skill, neither of which could be applied in their then uncertain tenure of possession.

This fact is proved by the edict* of Isabella, dated 1497, which effected a material alteration in the relative value of the two metals. It may also be inferred from this edict that Spain possessed but little gold in circulation at that period, for the importation of the precious metal which occasioned it only amounted to about £60,000.† The edict of Medina reduced the relative value of gold and silver from 11 6-10ths to 10 7-10ths to 1; the former ratio having obtained for a very long period.

From the middle of the fourteenth century, the kings of Castille rigidly prohibited the exportation of the precious metals, believing them, according to the political economy of that age, to constitute the wealth of the nation. In 1480, the Cortès of Toledo formally demanded of Ferdinand and Isabella a stricter application of those prohibitory laws, and it was declared highly penal to export gold in any shape, or under any conditions. Not only bars of gold, but coined money, vessels of gold, ornaments, and every article into which the precious metal entered, were minutely specified. Upon the importations, however, of America becoming enlarged, it was found impossible to maintain the prohibitive laws, although every expedient was adopted to that end. In lieu of freely exporting

* L'Edit. de Medina. Journal des Economistes, 1848.
† Humboldt. Geographie du Nouveau Continent.

the gold, which she received in abundance, in exchange for commodities, which would have kept down prices in her own markets, Spain pursued an opposite course. The accumulation of the precious metals naturally advanced the price of commodities, raised the rate of wages, and increased the cost of the raw material, so that instead of being an exporting, the Spaniards became an importing people, and gave their dearly-cherished gold for the manufactures which their own looms had previously produced. Labour had some difficulty in breathing freely in the golden atmosphere which spread so suddenly over Spain, and soon began to exhibit symptoms of decline; and the very element which promised to strengthen her industrial energies ultimately wrought their ruin and decay. We must here, however, confine ourselves simply to the fluctuations in the value of the precious metal.

It is almost impossible to ascertain the quantity of the precious metals imported from America into Spain, during the two centuries after the discovery of that country. A rough estimate is the utmost that can be achieved. Under the reign of Charles V., the royal functionaries allowed ten years to elapse before they rendered any account of their stewardship; and the records in the provincial treasury of Potosi do not go beyond the first year of Philip II. The statements of Moncada, Ustariz, and Ulloa, are generally considered apocryphal; while the sober estimates of Humboldt are treated in a similar spirit by a modern authority, whose historical knowledge few will question, however they may value his economical researches.* Relying upon the statements of the Venetian ambassador, M. Ranke is inclined to a *mezzo termine* position, knocking off a few millions there, and adding them here, so as to diminish the inflated estimates of the vain-glorious Spaniards, on the one hand, and to adjust the too trenchant calculations of the learned German on the other. Suffice it to state that the quantity of gold and silver which was imported into Europe, in one form or other, during the sixteenth and seventeenth centuries, had the effect of augmenting the ratio of the two metals:

* Ranke, vol. v., p. 371. Humboldt, Liv. iv., ch. 2. Memoire inséré dans la Collection de l'Académie de l'Histoire de Madrid, t. iv. p. 293.

first, from 10 to 1 to 14 to 1; and secondly, to keep it oscillating between 14, 15, and 16 to 1, until it settled down to about 15 to 1, at which point it has since remained.

Antecedent to the discovery of America the different countries of Europe were about on a par, as respects the precious metals. A summary sketch of the use of gold in one will furnish an insight into that of all, more or less. Our remarks, however, apply principally to those people who were either wholly or partially, engaged in commercial and manufacturing pursuits. In every country of Europe, where the precious metals were in demand, there were invariably found a class of men who preyed upon the more simple and honest portion of their neighbours. Nor did these ingenious men belong to any one country, but travelled about from city to city, giving every community the benefit of their peculiar operations. These were your clippers of coin, your debasers, your sweaters, and *mirabile dictu*—considering in what veneration they were once held—your *alchemists*. The last shall be first in our treatment of these worthies.

The transmutation of the baser metals into gold and silver, the chief object of the genuine alchemist, was not merely believed to be possible, but regarded as certain, by most of the enlightened chemists of the seventeenth century. It is even said that Lord Bacon, the great light of that age, had some lingering fancies in favour of alchemy, though his pure intellect, in its unclouded moments, must have repudiated it. According to the traditions of the alchemists, the first gold coined in England after the conquest was produced by *projection*. Raymond Lully, the *facile princeps* of the artful mystery, who visited this country in the reign of Edward I., created the gold which was stamped in the rose-noble of that monarch. At one operation alone, we are told that Raymond changed £50,000 weight of quicksilver, lead, and tin, into pure gold; and, from first to last, he furnished the mint with bullion to the amount of six millions. We simply content ourselves with citing these remarks from the pages of history; their value must be determined by the reader, who will view them, we apprehend, simply as landmarks which record the progress of intelligence, and the

gradual emancipation of the mind. The clippers, sweaters, and debasers, must be despatched with a single observation: show men a profit or gain, in any form, or in any pursuit, and they will follow it in opposition to law, religion, or reason. Wise legislation, therefore, should ever aim to diminish these temptations to evil gain.

The first gold coin, we believe, issued in this country was by Henry III., in the year 1257, which weighed two silver pennies, and was ordered to pass for twenty pennies of silver. The citizens of London, however, complained of its being over-rated, and it was re-called. The next instance of gold appearing in the shape of coin was under Edward III., in the year 1344; that monarch having issued no less than six gold coins: and by the same authority we are informed* that gold was first coined in Scotland in 1371 by Robert II. Reverting to England, we find that a new gold coin was issued by Henry VII., called the Sovereign, and sometimes the rose-real, or double rose-noble, of the value of 20s.; there were also half and double sovereigns struck for special occasions. The value of gold in the next reign, Henry VIII., was estimated in the operations of the mint at twelve times its weight in silver.

As the productiveness of the silver mines of America increased, the value of gold, compared with silver, naturally advanced. To diminish the oscillations which the two metals were subject to during the last two centuries and a-half, the greatest intelligence that the country produced has been employed, but not always with effect and success. Bacon, Coke, Locke, and Newton, have all applied their highly-gifted and practical minds to the solution of the difficulties which have periodically presented themselves, in relation to the respective values of the precious metals; and the result has been that a temporary adjustment was rather aimed at than the adoption of an enlarged and permanent principle of action. However, these great lights made it much easier for those who were destined to follow them; and to their labours may be attributed the subsequent and successful efforts of a Liverpool, a Horner, a Huskisson, and a Peel.

* Henry. History of England, vol. i.

The following scale may not be deemed inappropriate in this place, as it shows the alterations in the relative value of gold and silver since the discovery of America, from 1601 to 1717 :—

	£	s.	d.
43rd Elizabeth, the ounce of gold was coined into	2	15	10
4th James I.	3	2	1
9th James I.	3	7	7
13th Charles II.	3	14	2
3rd George I.	3	17	6

The act of 1717 determined that one ounce of gold was worth fifteen ounces of silver; this was the proportion existing between the two metals as commodities.

In the year 1774 we definitively adopted the gold standard. The fluctuations in the value of gold, from that period to 1797, occasioned by the first American war and the fearful explosion of the French revolution, led to the famous Orders in Council, and Bank Restriction Act, which continued till the restoration of peace. The enormous issues of paper during that eventful struggle caused the value of gold to rise in the market to a most alarming height, and although the terrors of the law were held out to deter individuals from disposing of guineas for more than their nominal worth, the value of the precious metal which they contained commanded as high a price as 27s. and 28s. for each. We are not writing a history of monetary affairs, therefore shall content ourselves with stating that the Bullion Committee of 1810, under the chairmanship of Horner, assisted by the sagacity of Huskisson, prepared the way for a restoration of the currency upon a sound and rational basis; and that the bill of 1819, with its complement of 1844, both the productions of the lamented statesman, whose name is in every one's recollection, permanently fixed it there.

In order, however, to preserve the chain unbroken, which metaphorically represents the supplies of the precious metals, we shall furnish a few more details that may serve as connecting links between ancient and modern times:—

Relying upon the statements of Humboldt,* the aggregate produce of the Americas, from 1700 to 1810, inclusive, was upwards of seven hundred millions sterling, averaging annually, . . £7,149,676

* Nouvelle Espagne, liv. iv., ch. 9.

According to the calculations of Jacob, Europe received from the different States of America, from 1800 to 1810, upwards of forty-seven millions of dollars annually, which, at 4s. per dollar, gives . £9,500,000

The same authority states that from 1810 to 1821, during which time the civil wars prevailed, the annual produce of the Americas was sixteen millions odd of dollars, or £3,400,000

M'Culloch, basing his calculations upon the data of Humboldt, estimates the annual value of the American States to be upwards of forty-three millions of dollars, or £8,700,000

Another authority * has furnished us with the supplies, from the same source, of 1840, which only give a total of thirty millions odd, or £6,142,000

The Northern States of America—Georgia, Carolina, &c.—from 1828 to 1841, supplied an annual average of upwards of half a million of dollars according to one authority,† while another ‡ gives the average of the last three years at upwards of eight hundred thousand dollars. Taking a mean between the two, the annual supply may be stated as £114,060

Russia has furnished a large supply of gold to the European markets, since the working of her mines was placed upon a scientific footing. Between the years 1830 and 1842, both inclusive, the production amounted to 222,156 pounds avoirdupois, or thirteen millions and a half sterling—the last three years the produce being considerably increased.

From 1847 to 1851 the returns amount to 7646 poods, and calculating the pood in round numbers at 36 lbs. avoirdupois, the value of the produce will be 275,256 lbs., which gives an aggregate of upwards of £12,000,000. Erman gives the returns for 1851 different to the preceding, which were furnished by the Russian Government to Sir R. Murchison (*vide* Hunt's Statistics). He states that the produce amounted to 1546 poods, which is nearly 300 poods more than the latter returns, or £471,020 more in value. Taking the average of their various sums, it will give an annual supply, from 1830 to 1851, of £1,277,713

* Statistics of Gold. By Henry Hunt, Esq. Mr. Hunt makes this quantity of dollars equal to £5,600,000, which, we presume, is a mere slip of the pen. Taking the dollar at 4s., as in the preceding conversion, and it will give precisely the sum stated in the text. In the statements of the produce of the Russian mines, Mr. H. appears to have been exceedingly negligent, to speak in the mildest terms. For instance, he assumes at the outset that the Russian pood is equivalent to "about forty pounds troy," whereas it is equal to 36 lbs. avoirdupois in commercial calculations (*Pope's Journal of Trade*, article *Russia*), and in the precise demonstration which science requires, it is assumed as equal to 36 lbs. 2 oz. avoirdupois (*Murchison's Geology of Russia in Europe, and the Ural Mountains*). Again, the aggregate of the five years' produce from '47 to '51, is given as 7546 poods—it should be 7646 poods. When converted into pounds troy, it is made to equal 296,932 lbs., whereas, according to the equivalent unit of Mr. Hunt, it ought to be 301,840 lbs. Such are a few of the *lâches* which are pretty thickly sprinkled over the calculations, particularly those on Russian produce, and which, in a work especially devoted to the information of the industrious classes, we should scarcely expect to find.

† Statistics of Gold. ‡ The Gold-Seeker's Manual. Professor Ansted.

The following table, furnished by the Bank of England to Mr. Hunt,* will be read with considerable interest, as it places beyond a doubt the quantities of gold coined, and the sources whence they are derived:—

GOLD IMPORTED.

	1850.	1851.	To June 30 1852.	
	£	£	£	
South America,	287,000	185,000	33,000	Supposing importation to continue at same rate to end of year.
Africa, . .	60,000	28,000	15,000	
Russia, . .	237,000	905,000	905,000	
Turkey, . .	262,000	140,000	150,000	
California . .	700,000	1,300,000	1,100,000	£2,000,000
Australia, . .	———	40,000	2,600,000	5.200,000
United States,	———	3,300,000	2,000,000	4,000,000

Mr. Hunt calculates, apparently from the preceding document, that the supplies from the United States, California, and Australia, will amount to about £11,000,000, which, with the supplies from other sources, will amount annually to upwards of nineteen millions of pounds sterling. In a subsequent chapter we shall enlarge upon this subject; therefore content ourselves at present with simply collecting the necessary data for that purpose. We cannot, however, refrain from a remark or so upon the following sentence, which contains nearly as many errors, as there are members composing it:—

"Howbeit, let it not be forgotten that the exportation of coin from England is rapidly increasing, and the English sovereign is becoming every year more extended as a medium of exchange. *Formerly the Spanish dollar passed everywhere, and now the English sovereign is taken as current coin over three-fourths of the globe;* and its exportation keeps pace with the importation of raw gold."†

Reversing the order of arrangement, we shall take the last member of the sentence first. The export of the coined gold is a natural consequence of the "raw gold" imported; it simply measures the production of the latter at the mines. Sovereigns are in great demand to pay for the "raw" gold, and to purchase provisions for those who have to sell it, and as long as gold is produced in such large quantities, a corresponding amount of sovereigns will find their way to the scene of pro-

* History and Statistics of Gold. Lectures on Gold. Bogue.

† History and Statistics of Gold, p. 203. By H. Hunt, Esq.

duction. Gold-dust is not so exchangeable at the diggings for provisions as sovereigns; nor can gold-dust purchase gold-dust, but sovereigns can. Hence the production here is *pari passu* with the production of the "raw gold" elsewhere; the one precisely measures the other. The gold from California would have found its way to the United States had there not been a debt owing to this country, which has been liquidated in "dust;" the mint of the United States, however, is as actively employed as ours in coining the "raw gold" which finds its way there for that purpose, and is equally active in exporting the coined metal to perform the same duty as our sovereigns, both being required to meet the demands of those who are either employed in digging for gold, or in supplying the wants of those who are.

The next member of the sentence, which we have underlined, is so opposed to practical experience that it is scarcely entitled to a separate notice. The English sovereign is not current coin over three-fourths of the globe, as every traveller knows; it is not even current over three-fourths of Europe, as Mr. Hunt may prove if he be disposed to put his corpus into any railway he pleases on the other side of the Channel. In Paris, Hamburg, Amsterdam, Florence, and Vienna, the sovereign is pretty well known by the money-changers, who give a premium upon it in exchange, according to the rate of the day; but if a Bank of England note be presented to those worthies, they will give a higher premium upon it, and prefer it to the sovereigns which it represents, and for this simple reason—that the note is better currency than the sovereigns, and is more in demand for that purpose. But we are now alluding to one or two of the great highways of Europe, where the sovereign is partially current; let us now transport ourselves to the bye-ways, aye, even to the general high-ways, with sovereign in hand, and what will be the result? A dead halt. You will meet with a regular *On ne passe pas*,—unless some money-changer happens to be in the vicinity, which is not frequently the case. The sovereign, in short, has no pretensions to even an European circulation, as every tourist, not to say traveller, has very good reason to know, who ventures forth without any other coins in his pocket.

Nor has the Spanish dollar diminished in circulation; it is still the common medium of exchange throughout the Eastern Archipelago—the only money received in payment for commodities by that vast population which is spread over the Chinese seas and the Pacific ocean. The dollar circulates, readily, at New York and at Canton; and there is scarcely a Malay or Javanese that is not capable of recognizing its intrinsic value. This fact was clearly demonstrated in 1828, when a coinage of Columbian dollars, nearly similar in obverse and reverse, but slightly inferior in quality of metal, was introduced by the Americans to the Chinese markets. Suffice it to state, that they were instantly rejected, and have long since disappeared. The Spanish dollar, as it is technically called, is the only coin in existence that may be said to have an almost universal currency; and had Mr. Hunt used the term "dollar" instead of "sovereign," we should have been spared at least a couple of pages of manuscript. We shall point out, anon, where the sovereign does circulate somewhat largely, or rather, where it finds its tomb, and ceases to circulate as a coin.

From the preceding observations the following deductions will easily be drawn:—

First, that gold has hitherto steadily maintained its value in relation to other commodities from the earliest period to the present time.

Secondly, that all the violent oscillations in the relative value of gold and other commodities, may be traced to causes which have no connection with gold itself; such, for example, as the discovery of silver in Spain by the Phœnicians, which altered the relative value of gold and that metal throughout the then markets of the world. The same remark may be applied to the Athenian mines of Laurion, and to the American mines in the 16th century. In these several instances a large and sudden supply of silver naturally lowered its value in the market, and proportionately raised that of gold.

Thirdly, that temporary alterations in the relative value of gold and other commodities, have principally arisen from wars and conquests, which have a tendency to disturb or destroy the ordinary channels of supply and demand.

And, fourthly, that permanent alterations in the value of gold although the produce of California and Australia seems of a highly exceptional nature, have arisen from enlarged supplies of silver, while that of gold has been pretty steady in all ages.

The value of gold, however, has been gradually rising, in relation to silver, for some years past, which we shall endeavour to elucidate in a subsequent chapter. In the meantime a glance at the productions of the Californian and Australian mines will enable us to enlarge the basis of our calculations, and probably furnish the required data for a satisfactory solution of the question.

CHAPTER V.

AUCKLAND ISLES—TRIP TO THE GOLD FIELDS OF CALIFORNIA.

THE following narrative is exclusively compiled from the letters of a friend, whose racy and practical observations have already been favourably received by the public,* and whose experience stretches over a period of fifteen years, the principle portion of which has been spent in New South Wales and the islands of the Pacific, in one pursuit or other. Some of the views, especially as regards New South Wales, are different to those ordinarily presented; and if they possess little merit themselves, they may probably awaken suggestions in others who are gifted with a more practical and sagacious turn of mind.

"*At Sea.* Lat. 3 miles South; Long. 177° 17'.

"I had just commenced writing to you the other day, when 'spouts' were hailed from the mast-head, the boats were instantly lowered, and all hands at their post, so that I was obliged to lay down my pen and hurry on deck to do my share of the work. In the course of the day we had three whales alongside, and with slight intermission have been taking them in ever since, a better run than usual presenting itself. There is a great deal of bustle and excitement while the game lasts,

* Perils, Pastimes, and Pleasures, of an Emigrant in Australia, &c. 1849.

and a pretty considerable amount of dirt and work after it is over; but as I have as little as possible to do with the dirt, I find it anything but a disagreeable pursuit. The duty assigned to me is to attend to the 'try-pots,' and see that the oil does not run too rapidly into the 'coolers,' which it frequently does if not properly regulated. When this is the case, a great loss is generally sustained, so that it is necessary to exercise considerable care, and keep a steady eye upon the pots. Ere I give you a description, however, of my recent adventures, permit me to remark that I met with a somewhat curious accident which threatened the loss of my right hand, for some time at least. I nearly cut off two of my fingers, and have just removed the bandage to take up my pen, but they feel so stiff and cramped, that I can scarcely use them; so that you must excuse my hieroglyphical zig-zags. We had just hoisted on deck the jaw of a large whale, measuring about seventeen feet in length and containing a remarkably fine set of teeth, and as all hands were more or less busy in cutting them out, I took up a boat-knife to assist them, and commenced cutting away like the rest. The teeth of the whale are imbedded in a tough, whitey, and resisting substance, so that it requires considerable dexterity of hand and knife to cut them clean out from their sockets; and as I was forcing the knife round a large tooth, my hand slipped right on to the large blade, which cut my little finger to the bone, and nearly through the joint of the next, having grasped pretty tightly the handle of the knife, which was covered with oily matter. The wound, however, has healed somewhat sooner than I expected, but I have no feeling in the last joint of the little finger, and very little in the next, for the nerve is completely divided. Nor can I move freely the joints of either of my fingers.

"We are now in what we call fine weather,—that is, without gales of wind, under a hot and scorching sun, with a few squalls, and occasionally rain,—and are making our way down to the Auckland Isles, which are sometimes difficult to reach, from the winds obstinately blowing in a certain direction for weeks together.

"This group of islands will become, in the course of time,

nearly as important as New Zealand or Van Diemen's Land, although they are little known at present, from their lying beyond the ordinary range of traders. But the case has materially changed since the Aucklands have been made a whaling station, and are gradually becoming the centre of a promising and profitable industry. When I visited these islands in 1845, they were totally uninhabited, nor did they exhibit the slightest sign of there ever being a human habitation upon them. The grave of a French sailor, with its simple memento, reminds the visitor that one of an adventurous crew, on a voyage of discovery, is there laid low with his mother earth, the solitary symbol of human existence in that, till lately, lone and untenanted spot. There is now, however, a neatly-built residence, several stores, and a number of cottages, all of which are fully peopled by industrious beings. These buildings are at the head of *Laurie Cove*, perhaps one of the most beautiful inlets on the wide range of the ocean. The whole of this whaling establishment is under the superintendence of Mr. Mackworth, who represents a company formed in England same years ago for whale fishing in these southern regions. The number comprises about one hundred and twenty hands, chiefly English, with a few New Zealanders, who are allowed to remain, and who work like the rest. I came down here in the Lord Hardwick, one of the Company's vessels, from Sydney, having entered into an engagement similar to my last—as surgeon to a whaler—but with this difference, that my services are not to be confined to a single vessel, which hitherto has been the case.

"These islands are situate in 51° south latitude, and 166° east longitude; they are about 180 miles south of New Zealand, and 900 south-east from Van Diemen's Land. The group was discovered in the year 1806, by Captain Bristow, in the course of a whaling voyage in a ship called the Ocean. In the following year, Bristow repeated his visit to the islands in the Sarah, and took formal possession of them in the name of the Crown; and, as a token of his visit, left on shore a quantity of pigs, which appear to have thrived remarkably well. Whaling vessels frequently resort to these islands for fishing purposes,

especially in the months of April and May, when the whales go into the bays to calve. These islands are also found convenient places for vessels to wood and water at, and where they may easily heave down to repair.

"Port Ross is at the extreme north of the island, and contains secure anchorage for vessels. From the entrance to the head of the port, the distance is about four miles. Entering the harbour from the north, you pass Enderby Island on the right, the Ocean Island and Ocean Point, until you reach Laurie Harbour, which is not visible in the line of sight, as it runs behind the back of a small wooded peninsula, which projects into the sea. After passing Ocean Island, a ship may anchor in perfect safety in any part, but the upper end of the inlet (Laurie Cove), is most suitable for ships wanting to heave down, or to undergo extensive repairs. It is perfectly landlocked, and the steep beach on the southern shore affords the greatest facility for clearing and reloading vessels. This bay is encircled everywhere by elevated land, and clothed with trees from the seaboard to the summit; the soil, of volcanic formation, is covered with a thick layer of vegetable *debris*, which produces a vigorous growth of large ferns, but which might be made capable of producing many things of greater value.

"Still very little is known of this interesting group, which consists of one large and several small islands—Auckland, Adam's, Enderby, Disappointment, Rose's, Ocean, Shoe, and others. The largest island is about thirty miles long, and its extreme breadth about fifteen miles; it contains three principal harbours, whose entrances are from the eastward. Carnley's Harbour is situate in the south part of Auckland Islands; and several masters of whaling vessels, who have visited the island, prefer this harbour to Port Ross or Laurie's Harbour, highly as the latter deserve to be spoken of. Carnley's Harbour is about four miles eastward of the South Cape, and the entrance is formed by two bluff points, from which to the head of the lagoon the distance is about fifteen miles. The passage is about two miles wide, and generally within twenty-five fathoms of each shore. It runs in first N.N.W., then N.N.E.,

forming at the head of the lagoon a beautiful basin, with sufficient room for half-a-dozen ships to moor.

"The western side of this island is a perpendicular, bluff, iron-bound coast, with deep water within one hundred fathoms of the shore; while the eastern coast is principally lined with a pebbly or sandy beech, behind which are extensive level plains covered with luxuriant verdure, extending back from four to five miles, and then rising into elevated hills. The hills, except a few of the highest, are thickly covered with trees, which seem to flourish with great vigour, and are lofty and rich in foliage. The larger of the trees are of two kinds; the one resembles our large firs, the other is nearly allied to the maple, and might be usefully applied to building purposes. The quality of the soil is indicated by the general luxuriance of its productions; and were the surface cleared, it might be converted either to pasturage, or even to tillage on a limited scale. It reminded me of some portions of Van Diemen's Land, but very different to what I have seen in New South Wales, except in a few isolated spots. The plains, the valleys, and the hill-sides are covered with a heavy and luxuriant grass, with here and there some fine specimens of the vegetable world, little known elsewhere; the climate is mild, temperate, and salubrious—but this is written in December, the most beautiful of the summer months in these latitudes. I am informed, however, that in the month of July—the depth of winter—the weather is generally mild, and that the mercury is seldom lower than 38° in the valleys, while the trees maintain their verdure as though it were midsummer.

"On the northern parts of the island, especially about Rendezvous Harbour, the hills are covered with trees of a low and diminutive size, and so thickly intersecting each other that it is difficult to make your way through, or even to penetrate, them. There is also a thick growth of underwood and dwarf bushes, intermixed with ferns, which renders it almost impossible to discern the surface or nature of the soil. Moss and tall grass cover some of the highest level spots, and a kind of grain grows rather profusely, upon which some of the birds occasionally feed; but the ground is generally dry, the water being

confined to the streams, which are not very large, but exceedingly pure. The birds are rather numerous, especially those of the genus *procellaria*, which are very tame. Some of the smaller kind are like those of Van Diemen's Land, both in plumage and in song; but there is one little warbler whose plumage is black, spotted with yellow, which sang with so joyous and musical a note that it was a treat to listen to it. The notes of this little chorister were sometimes as mellow as those of the English blackbird, though not so full in volume, while at others they reminded me of the trilling melody of the lark. This bird was the most numerous of all the songsters, and, from the shape of his beak, must feed principally upon insects. Indeed, I did not see a single bird with the thick, short, hammer-beak of our graminivorous kind; all were armed with the long and attenuated mandible, which at once indicates the nature and habits of its owner. The hawk species are pretty thickly sprinkled among the feathered race, and seem to be fully occupied in thinning their ranks. These sulky and solitary birds may be seen in pairs, perched generally upon the dead and uncovered branches of the loftiest trees; and, judging by the marks along the coast, it might be safely affirmed that their ravages were not subject to any particular restraint. The sea-birds are exceedingly numerous on the southern side of the island, as the fish are there in greater abundance than where the beach is low, and gradually shelves into the water. We saw some grey ducks, but no geese; there are, likewise, some snipes, cormorants, and the common shag. The land-birds are not bad eating, especially the hawk, which is rather singular, as no one would venture upon the latter in England, were he ever so hungry. There is no species of land animal, if we except the domestic pig, which was left here by Bristow when he took possession of the island, and which seems to thrive, as also the goat and rabbit, all of which find plenty of food growing in a wild and luxuriant state.

"The geological structure of the group is well deserving attention. Nearly the whole may be termed of volcanic origin. The old formations of granite, schist, and lime-stone, have, in many instances, been highly metamorphosed by trap, porphyry, sien-

nite, and serpentine; and where the rocks are exposed, as they are in many parts round the coast, the quartz nature of the veins, which more or less intersect them, would indicate that they are highly metalliferous. In some instances the basaltic columns rise to the height of 300 feet perpendicular, and exhibit all the phenomena of that kind of eruptive formation; while the mountain, which may be said to cap Laurie Harbour, rises as high as 900 feet, with but few undulations between its base and the water's edge. On the top of this mountain, and along a considerable portion of its sides, are groups of basaltic rocks, while below, in the ravines, indentations, and valleys, may be seen the usual detritus of such structural formations. The rivers are numerous and rapid, which might be imagined from the surface of the land being rocky, abrupt, and undulating. The islands altogether, especially on many parts of the coast, have a picturesque, wild, steep, and basaltic appearance; but in portions of the interior they are exceedingly interesting, rich in soil, and capable of being turned to a profitable account.

"On the 24th of November we cleared Enderby Island, after leaving Laurie Harbour, and were running before the wind with a fresh breeze, which soon took us into the deep blue ocean, and out of sight of the island. We had provisions on board to last twelve months at least, a rather longer cruize than the whaling craft now take, especially from the ports which are in immediate contiguity with the whaling grounds; and in the event of our running short, we had only to put into one of the numerous islands which intersect the line of our voyage, where a fresh supply can generally be procured. The first night we were at sea it came on to blow most lustily, as the sailors express it, and the ship fearfully tumbled about in the deep water, which washed over us like a half-tide rock. About midnight a heavy swell swept away the binnacle, carried overboard the compass, knocked off our cabin sky-lights, and poured down like a cataract into the cabin, setting almost everything afloat. We had on board four whale-boats ready for lowering, and two spare ones on the skids; but the sea swept one of them clean away, leaving neither fastenings nor davits, which were broken short off as

though they had been mere rotten sticks. We tried hard to save the boat; but the elements were too much for us. We then hoisted on board the larboard waste-boat, and lay-to under close-reefed maintopsail, maintrysail, and foretopmast staysail, till the storm blew itself out, or, in other words, till it appeared to have become spent. For four months we cruized northward, and encountered, almost throughout, heavy blowing weather, rolling seas, and gales of wind, with but few intervals of fine weather. Our success was anything but encouraging, for we only took in five whales during the whole time. These whales, however, were a pretty good size, and yielded a large quantity of oil, which in some measure made up for the deficiency. The sperm-whale is the game we are in pursuit of; the black, or Greenland, is rarely seen in these southern latitudes.

"The first place we made was Lord Howe's Island, which is justly considered as one of the most beautiful and romantic spots in the Pacific. Some parts of the island rise perpendicularly to the height of 600 or 700 feet from the level of the sea; others were so low that a gentle undulation was formed even down to the water's edge. We experienced, however, great difficulty in landing. The interior of the island is richly wooded; there we saw the tall cabbage with its graceful plume, and the tangled fig-tree with its singularly shaped stem and branches. The islanders were principally immigrants from New Zealand, among whom were three Englishmen who had married New Zealand women, who bore a pretty numerous family to each. There we purchased pigs, goats, and poultry, and observed that pumpkins, water-melons, onions, and cabbages were growing rather abundantly. The birds were not only numerous, but displayed a beautiful plumage; and having my gun, I killed more in the course of the day than I could well stuff, while in a proper condition. The great drawback to the pleasure, however, was getting back to our ship, which in the morning lay fifteen miles off; and having to pull against a heavy swell, it was anything but easy work. Luckily, she had beat up nearer towards evening, so that we got safe on board about an hour after sun-down.

"The next island, or rather group of small islets, we touched

at, was called the 'Three Kings,' whose appearance was anything but greeting and cheerful, for bold and rocky projections fronted us on every side. We could not find a single convenient place for landing, nor a spot on which we could venture to push our boats, although we diligently searched all round the group. Wanting some pigs, two boats were sent from the ship; and after steering round the largest island, in opposite directions, we were at length obliged to jump from the boat on to a projecting rock, while one of the crew stood by to keep the boat from bumping to pieces.

"Ascending a broken, irregular, and nearly perpendicular rock to its summit, we perceived several of the natives, who were quietly awaiting our arrival. On looking round, we descried some rather fertile slopes of land; but there was a deficiency of timber, which materially detracted from the beauty of the scene. The streams of water, however, were murmuring through their rocky channels, the birds were singing a cheerful note, the day was beautifully bright and clear, and the varied tints of reeds, tea-trees, short scrub, with here and there a small patch of green, made up a scene so pleasant, a landscape so enchanting, that I linger on it, even now, with pleasure and regret. We were informed that there were only twenty-seven inhabitants on the island, including men, women, and children; and, according to our informant, these were nothing more than a remnant of one of the conquered tribes of New Zealanders, who sought, in that almost inaccessible spot, a peaceful refuge from their destroying enemies. The old chief, near to whom I sat down, was partly enveloped in a blanket, and was deeply tattooed all over his face. I gave him a pipe and a piece of tobacco, with which he seemed much pleased, and expressed himself, in manner at least, highly gratified. One of the natives, who had been a whaler, and spoke a little English, made especial enquiries about the grog, which induced us to gratify him with a slight taste of it, in return for which he invited us to his house or hut, where we stayed for about a couple of hours. His wife, who had a rough mat, or *Cockahoo*, round her waist, in the mean time squatted herself on the ground, and cooked some fish at a

fire, which we relished as highly as hunger and a good appetite would allow us. We furnished biscuit and grog. Several of the natives seated themselves beside us, and appeared as much amused as ourselves, especially two little girls, who seemed more timid than the rest, and who kept a very respectful distance, which naturally excited our attention. These young creatures gazed upon us with apparent wonder and delight, and occasionally laughed with the usual hilarity of childhood; and being in a state of nudity, their smooth, dark, skins glistened in the sun, while their movements were characteristic of the most innocent freedom. We soon left this island, as provisions were scarce, other ships having just forestalled us. We, however, bartered two niggerheads of tobacco for four pigs and a couple of baskets of potatoes, although the pigs were very small, and as wild as rabbits. One of our men exchanged his woollen shirt for a couple of the little grunters, and managed to pull on board quite comfortable without it. Another, in making his descent, had fixed himself on a point of the rock, with a large pumpkin in his shirt, and a pig under his arm, which completely paralyzed his movements, so that he could neither get up nor down, without losing his provisions; and had we not rendered assistance, he would have lost both, for it was sufficiently difficult to descend without being burthened with either live or dead stock. At length we stood out to sea for the ship, which lay a long way off; but having taken her bearings, and steering by the compass, we reached her in about an hour after dark.

"Shortly after we left the 'Three Kings' we made for New Zealand, first rounding North Cape, and then running into a small and secure harbour in Doubtless Bay, called Mungonutie, which lies about sixty miles to the north of the Bay of Islands. We were towed in by four boats, with six men to each boat; and, as they were pulling all night, we endeavoured to lighten their labour by singing songs, while they joined in chorus, and kept time with their oars. We had scarcely anchored, however, before a canoe, with about thirty natives, came off to our ship; these natives were all women except a chief, who had a green camlet cloak thrown over his shoulders, a large tuft of white down

stuck rather jauntily in his ear, while his hair, besmeared with fat or oil, hung in black ringlets all round his head.

"The Franklin, an American whaler, anchored just behind us, and these South Sea nymphs favoured both vessels with as lengthened a visit as they were allowed. The next island we landed at was Mangea, where we met with similar treatment as regards the natives and the exchanges we made with them. After leaving Mangea we made for Whylotacke, where an English missionary was stationed, who seemed to be 'monarch of all he surveyed,' for the natives were obedient and submissive to his will to the minutest particular. I have not space to describe the old chief, his young bride, nor Riley and his wife, who came out in the Camden with Williams, who was brutally murdered at Eromango. Here, as elsewhere, we bartered with the natives yams, pigs, ducks, fowls, turkeys and potatoes, for boat-axes, blue cotton prints, and dungaree. I left the old chief two or three boxes of Epsom salts in addition, for which he expressed his hearty thanks. We intended to touch at Palmerston Island, to take in cocoa-nuts for our live stock, as the place abounds in fruit of this kind, which we stood much in need of, but hearing that some white men, not of the best character, were on the island, we thought it prudent to decline.

"At length we put in at Oahu, one of the Sandwich group, to obtain provisions, after a long, dreary, and profitless voyage to the northern latitudes of the Pacific, having sought the 'field' of whales, which we heard of at Mangea, in vain. This, however, was one of the chances to which all whalers are subject, as we have sometimes a three month's run, with a man at each mast-head on the watch, without the cheering sight of a single fish. The whale herd had apparently migrated to the south. At this place, and at Honalulu, there are regular stores and stations, with several Americans and their shanties, or grog-shops, who carry on a regular business with the whalers, and with different parts of the Pacific. Vancouver's Island furnishes them with corn, pigs, potatoes, and dried fish, and receives in return sugar, pepper, dried woods, honey and spices, a great portion of which finds its way to Europe. There it was that we first heard of the gold in California, which

created the most extraordinary sensation. Every one was for going at once, without thought or reflection, either as to the conditions under which the precious metal was found, or the peculiar labour required to find it. We had not been in Oahu many days, before the Franklin made her appearance, and shortly afterwards the Baltimore, which had been more southward, and had had a better run than either the Franklin or ourselves. As everybody, apparently, was going to Francisco, our captain made up his mind to go also, thinking to do a little business on his own account, and to leave just when it suited his purpose; but he was most egregiously mistaken, for out of the thirty-two men belonging to our vessel, there were only three who returned, after two months absence, and they were so ill with an ague fever, that they were almost useless. There were, however, several other crews in a similar condition, so that the masters and captains of vessels were completely powerless. The ordinary bonds of society seemed, in fact, dissolved, and men broke loose from their common engagements, as it were, by an instinctive impulse or resolution. Everybody took it for granted that it must be so, and remonstrance, sense of duty, and moral right, were so completely impotent against the over-mastering sensations which the search for gold had awakened in the minds of all, whether gentle or simple, that those accustomed to command, and those accustomed to obey, were alike the slaves of an inevitable necessity.

"Having stored ourselves with provisions, and our captain done his utmost to turn a penny on his own account, we left the island and steered in a north-east direction, as the winds were blowing to that point. At length we stood in for Menducino, a cape on the coast of Upper California, but, ere we could reach it, the wind changed, and we again stood out for sea, steering in a southerly direction. After a couple of day's fishing, with a little better luck, we sailed for San Francisco.

"The tide was flowing in the straits which lead to the bay of San Francisco at the rate of five miles an hour, as we entered about midway between the bluffs which mark the north and

south points. The Narrows, as they are called, are about two miles wide, and are bounded on the north by a range of mountains rising abruptly from the water to about 300 or 400 feet; the south, or opposite range, are not so high, but appear much richer in vegetation, being partially clothed with slopes of luxuriant grass. After a few miles sail we descried Bird Island, right a-head, with its numerous occupants of the feathered race, which had covered it with a rich deposit of guano; while on our left appeared Angel Island, and the Bay of San Salito, which affords excellent shelter to vessels against the violence of the back tide. On our starboard lay Yerba Buena, which blocks the cove of San Francisco from view, but shelters the town from the north-west winds, that are almost constantly blowing. The cove forms a beautiful indentation of the bay, and as you pass one or two high hills, the town and anchorage first appear in sight. San Francisco is built upon an amphitheatre, formed by the undulations of several roundly-topped hills, which rise somewhat abruptly from the water's edge; and as you ascend the highest of these hills on the left of the town, upon which the telegraph is stationed, you are presented with a fine view of the surrounding country, of its peculiar features of interest, and of the distant ocean. The town at your feet shelves down to the water's edge; in the cove you may descry a whole forest of shipping of every conceivable kind; and right before you is the finely-formed island of Yerba Buena, whose sides, in either direction, sweep down with such a gradual and lengthened descent to the water, that they form, as it were, a base line to the arc which the crescent of the cove presents. The summit of the mountain is indented as though it had been subject to volcanic action, and at a distance it assumes the outline of an extinct crater.

"Landing from our boat as well as we were able in such low water, we walked along one of the wharfs, composed of wooden planks and piles, which were in course of construction, and made up our minds to turn into the first house of accommodation that we met with. At the end of what is called the central wharf we saw painted up J. Bordon, which we soon discovered was what they call an hotel. In every direction we

saw houses, shanties, and stores; while in the water just below, and between what are called the wharfs, there were numerous small craft in the shape of boats, barges, &c. Extending our walk, we at length strolled into Montgomery Street, which may be denominated the leading thoroughfare of the town. There we observed several really fine shops, and well filled with almost every kind of goods, more especially the establishment of Burgoy and Co., at the end of the street. In Portsmouth Square we saw painted up in large characters *Winford's Californian Exchange*, the *Court of Sessions*, *Isaac Hall*, whose establishment we did not enter, the *Union Hotel*, *Parker House*, *Jenny Lind Theatre*, *Billiard Saloons*, and the *El Dorado*, of which we heard a great deal respecting its gambling *habitués*. The *Exchange Buildings* is sure to meet your eye; so also is the important notification, that—*Thompson and Hitchcock are Managers of Gregory's Californian Express.* In the corner of the *Plaza*, or old square of the town, you will find the *Post Office*, and next door neighbour is *Stiles' Foreign and American Newspaper Depot*, which reaches very little higher than the steps which lead to the entrance of the former. In the centre of the *Plaza* you may occasionally see a picturesque group or so, composed principally of the gaily-dressed Californian, almost always on horseback; of queer-looking vehicles, drawn by oxen, and as primitive as those of the most rural districts of old Spain; of idlers, cattle, horses, carts, and sometimes a priest, all of which present an aggregate of a most heterogeneous character. At Justh and Co's., lithographers in Montgomery Street, we purchased among other prints a representation of the fire in San Francisco, which was not badly executed; but the principal inducement to make the purchase was the circumstance of there being a lithographic press in a place just emerging, as it were, into the first condition of civilization. Here we had printed that destructive event in three languages, the '*Great Fire in San Francisco*,' the '*Grande Incendie en San Francisco*,' and '*El Gran Incendie en la manana del* 17 *de Sep.*, 1850.'

"Wherever we chanced to direct our steps there seemed the same excitement: all was bustle, activity, and rather unna-

tural hilarity. The hotels and grog-houses were crowded, and it was difficult to obtain a single thing without a great deal of solicitation; while money and spirits, to use a common expression, were literally flowing like water. The ordinary currency of the place was gold-dust, doubloons, and dollars. There appeared, in fact, amongst those whom we came in contact with, a perfect indifference to money, especially to small currency, which was left about and refused to be taken in exchange, as though it had been of no value. Everything betokened that money easily obtained is as foolishly expended; and there were plenty of instances to furnish another illustration of the familiar apophthegm, that of putting a beggar on horseback, and of his riding —— God knows where. In a French café we were charged three dollars for a cup of coffee, a thin slice of ham, and a couple of eggs; the wine and spirits being vended on a similarly extortionate scale. The spirits, especially the brandy, were of the commonest and most execrable quality; still, they commanded a ready sale, for men appeared to eat and drink as though they were in apprehension of being put on short commons for a considerable time.

"The ordinary pastime in San Francisco is gambling, which is pursued, according to all accounts, with the most exciting avidity. Most of the gambling-houses appear to be doing well, and many of the leading ones have bands of music to attract their victims, which, farcical as it may seem to a sober and rational understanding, in general have the desired effect. The common games are *Monte*, a favourite Spanish game, *Roulette*, and *Dice*, either of which is sufficient to bring out the fiendish element of the human heart, and to harden it into the condition of repulsive selfishness. Having, however, a thorough hatred of the vice in any form, not from what may be termed a mawkish *morale*, but from witnessing in so many shapes its evil results, I especially eschewed the flaunting and showy temples in which gambling was practised, and, therefore, can only relate what was gathered by hearsay.

"Strolling along the outskirts of the town, we witnessed some scenes of extraordinary richness and novelty, as regards character. Here were pitched the several tents of the immi-

grants who were *in transitu* for the diggings, and such a motley and heterogeneous assemblage it is rare indeed to witness. Mexicans, Peruvians, Chilians, Kanakas, Chinese, Americans, French, Germans, Italians, Spaniards, with here and there a sprinkling of English, were encamped right and left, and without the least apparent design as to whom or what your neighbour might be; here, also, might be seen every kind, size, colour, and shape of tent, pitched helter-skelter and in the most grotesque forms, and literally crammed with articles, both for sale and use, some of which would sorely puzzle any but their owners, as to how they could be applied. Having rambled about until we neared our boat, which was lying off the Long Wharf, we made for the ship, about a mile out in the bay, where we made up our minds to stay until an advantageous opportunity of visiting the diggings should present itself, which was rather sooner than we expected.

"The climate, on landing at San Francisco, is rather trying. The sun is excessively hot during the morning; on the decline of day the sky frequently presents an overcast and gloomy appearance, and at night time a strong north-west wind brings with it a heavy fog from the Pacific, which has the effect of chilliness, and of extreme discomfort. These winds blow for a great portion of the year from the northern regions, and, in their passage over some thousands of miles of ocean, become saturated with moisture, a portion of which is visible to navigators, in the shape of fogs and mists, when sailing on the Pacific. At some seasons they continue for weeks, at others for a few days. The sun, however, is sufficiently powerful at all seasons to dispel them during the day. The bread we obtained was pretty good; the water, except when obtained from some springs in the neighbourhood, is rather indifferent; beef, the principal article of food, is very good and reasonable in price; venison is equally common with beef, and bear-meat figures in the *carte* of the restaurants; but of its taste and quality we are totally ignorant. Fish are plentiful in the bays, and, we suppose, equally so at the *tables-d'-hôte* of San Francisco. Accommodation, we heard, was extravagant in the extreme, and of the most inconvenient order; labour was out-

rageously high, and as bad in quality, generally speaking, as it was extravagant in price. Common labourers were demanding from eight to ten dollars per day; carpenters and blacksmiths, the only mechanics ordinarly required, were receiving an ounce of gold daily; laundresses demanded eight dollars for washing your linen; and cooks thought themselves cheap at 150 dollars per month. The prices of houses and lots were from 10 to 75,000 dollars each; and a lot purchased for a barrel of *aguardiente* was afterwards sold for 18,000 dollars. A new hotel, three story frame, about forty to sixty feet, cost 180,000 dollars, and yielded a rental of twenty per cent. per annum; small rooms, scarcely longer than a common-sized bed-room, were letting for 400 dollars a month, but these, it ought to be stated, were for gambling purposes. Coined money, however, was in great request, notwithstanding the vast influx of gold, and realized an enormous interest.

"In fine, everything of a social nature was reversed in San Francisco. In most civilized countries the cheapest of ordinary things is labour; and in general it is so abundant that it can scarcely find sufficient employment, and is seldom adequately remunerated. As a rule, the smallest amount of talent, acquired skill, or capital, elevates its possessor from the lowest, or labour level, increases his gains, and enables him to call the labour of others to his aid; while the highest rewards of wealth are given to great knowledge, superior abilities, and the best skill and cunning in the accumulation of capital. The discovery of gold, however, has reversed this state of things, as least as far as San Francisco is concerned. No employment yields such enormous gains as that of gold-finding, or presents such excitable impulses to pursue it. There we have the spirit of gambling, which is more or less latent in the bosom of every created being, thoroughly developed, and, as it were, justified and encouraged by a legitimate pursuit. There the strong arm, the vigorous muscle, and the enduring stamina, are at long odds in their favour, so that the workman who has sufficient intelligence to break stones on a turnpike road, or who can roll bales of goods on a wharf, has the advantage of the profound scholar, the talented professional, the skilled

mechanic, or even the shrewd trader. In all the requisites for finding gold the first has the precedence, while the superior qualities of the latter are of little or no avail.

"At length our arrangements were made to visit the Sacramento. On board the Rainbow, we passed rapidly up the bay, sailed past Golden Rock, and the four rocks called the Brothers and Sisters, into the Bay of Pablo, or Sonoma Bay. Crossing this, we entered the Straits of Carquinez, which lead to Suisun Bay, on the north-east portion of which the city of Suisun is laid out, destined probably to become the centre of a great industrial community. Monte Diablo is here seen to great advantage, as it rises 3700 feet high, and, from recent examination, is found to contain pure limestone, which will prove highly advantageous in building and other purposes. Into this bay the Sacramento and San Joaquin discharge their waters; one from the north, through the placers of the gold regions, and the other from the south, which also waters certain auriferous localities. The berths in our little craft were but few, and scarcely adapted for one third on board, so that when night came on, half of us stowed ourselves away as well as we could, while the others kept watch. Being accustomed to the 'tumble-up' and the 'turn-out,' it made very little difference to me, but to others not hardened to the service it was anything but agreeable. This was about the first foretaste of the 'delights and dangers' of the diggings. The next morning breakfast, sail up the Sacramento, wild ducks in abundance, musquitoes in myriads on myriads, and the *tule*, or rush-marshes. At length, after sleeping on the banks of the river two nights, the difficulty of pitching our tents, the labour of 'warping' through the 'slough,' occasioned by the rapidity of the current against us, we reached a log cabin called Barber's Ranche, the original proprietor of which had been an old trapper. The heat of the sun, however, was excessive till about four in the afternoon, when the north-west wind sprung up and blew till ten or eleven at night, which caused a singular fall in the thermometer, and a consequent peculiar sensation to those who were exposed to its influence. The sky in general was beautifully blue, and the stars intensely

bright. After a couple days more of pulling up stream, we at length reached Sutterville, which consists of several houses built, and in the process of building, near the river. There were a couple of store-ships moored alongside the bank, and a red brick house about three hundred yards distant; having passed these, the 'embarcadero,' or Sacramento city, appeared in view. This landing is situate at the mouth of the American river, or rather at the junction of that river and the Sacramento. On a plain about two miles off is the famous Sutter's Fort. In an old board shantie on the shore, we purchased, for a dollar each, a piece of beef and a cup of tea, which we thought anything but unreasonable after the San Francisco charges.

"Like others, we pitched our tent on the banks of the American, which was here partially covered with oaks and sycamores, and certainly a more motley group, except the one on the outskirts of San Francisco, I never set eyes on, and could scarcely conceive—of all nations, all climes, all tongues, all conditions, strangely jumbled together, and mostly urged on by the hope of gain, which reconciles apparently the most anomalous conditions, and smooths away the most singular distortions. On our journey up every possible enquiry was made as to the best plan of getting to the 'diggins;' and we soon learned that the ordinary way was to hire a wagon and team of oxen to carry the baggage, and to tramp it in company therewith. As I had but little incumbrance, however, in the shape of baggage, except my blanket, rifle, and a packet or so of Epsom salts and quinine, &c., it appeared to me that a much better plan might be adopted,—by those, especially, who were simply desirous of arriving at the scene of action. I had no intention to dig in a really earnest manner to get the gold, therefore had made no preparation for that purpose; but if anything turned up of a less laborious and equally profitable nature, I could have no objection to take advantage of it. On my arrival, therefore, at Sutter's Fort, I looked round, and met by accident Dr. R——, whom I knew at Sydney, and who had just returned from the 'diggins,' and was on his way down to Sacramento. He advised me, by all means, to purchase a horse, and take the journey alone, as I was sure to pass

several on my way with their heavy drags, and who at least would indicate the course I ought to take. I accordingly purchased a little wiry brown nag, which I managed pretty well, although he was the first I had crossed of his kind; but having 'whipped round' in the Bush for some time in search of cattle, and the knack of riding there being so thoroughly acquired, anything in the shape of a four-footed creature can scarcely come amiss. Suffice it to say that I reached the Culoma Valley in about sixteen hours, instead of four or five days, which the slow teams, in the shape of wagons and oxen, are in the habit of taking. On my route I passed several ox-teams wending their dusty way slowly along, accompanied with trampers who seemed weary-worn, and, in some instances, sad, sulky, and really tired out.

"You may imagine a camping-scene. Indians, sleeping-out, cuyotes, staking the horses with a hair *lariat*, which is preferable to leather, as the wild animal just mentioned is apt to gnaw them asunder; in the morning shooting wild-fowl, or game *ad libitum*, afterwards, 'with what appetite you may,' disposing of sundry slices of fried pork, boiled beans, hasty slap-jacks, and a cup or two of coffee, not forgetting, as a closer, a puff or so of the fragrant weed.

"Culoma valley is about three miles in circumference, surrounded by high mountains, which are nearly covered with firs. The mountains are of igneous origin, and are broken into ravines, which are filled with water during the rainy season. This formation is supposed to contain gold, but the precious metal, as yet, has principally been found in the *gulches*. The basin of the valley is of common yellow-sand and pebble, differing entirely from the composition of the mountains, whose surface is covered with a red, sandy clay. The South Fork of the Americanos runs through the valley; it is a perfect mountain-torrent, and, in the flush of the rainy season, is at least fifty yards wide. A few tents were scattered about the banks of the stream; but in the western and southern portions of the valley there were about fifty frame and log houses, and as many tents, the numbers increasing almost daily. Here the find of the precious metal was considerable. Towards the

lower end of the valley, in a northern direction, stands the saw-mill where the gold was first discovered; and Mr. Marshall, the proprietor, we were informed, was realizing a handsome property by merely sawing timber for the shanties of the miners.

"The spot where the precious metal was first descried was pointed out to us; it is about fifty yards below the mill, where a large fir-tree extends across the stream. Here we saw some new comers first opening shop, and supplying the diggers with such articles as they required for the *nonce*. Powder was sold at sixteen dollars per ounce; percussions at two dollars per hundred; small belt pistols from thirty-two to fifty dollars each; a rifle realized one hundred dollars; clasp, sheath, and bowie-knives were usually sold at eight, ten, and sixteen dollars; while cigars were in demand from seventy cents to one dollar and a quarter per dozen. Gold seemed plentiful amongst the purchasers, for they turned out the dust from their deer-skin pouches into the scales with the greatest negligence, as though they were not particular as to a grain or so escaping.

"On the lower bar of the Fork, the miners were working in the greatest numbers. There the long-handled shovel was employed amongst the clumps of bushes, or on the sides of large rocks; there the pick and shovel worked among stones and gravel; anon, the trowel was diligently searching under banks and roots of trees; and the users of these several implements were as silently working as though they were living mutes, and the object they were in search of had completely subdued the powers of speech. At the edge of the stream, and in it knee-deep, other labourers were washing gold with tin pans, or the common cradle-rocker, while the sun poured down his hot rays upon their heads, and the water presented the opposite temperature to their legs and feet. This bar, or *placer*, comprises the higher portion of the sandy bed of the stream, which, during the rainy season, is covered with water, though now entirely open and exposed, and strewed over with stones, rocks, and clumps of bushes and trees. The gold was obtained, in this locality, by digging through a foot of sand and stones to

a deposit of clay, partially mixed also with sand; buckets of this material were taken down to the stream, and there subjected to the usual silting process of the pan or cradle. Some of the miners, however, dug down as low as four feet, where a bed of blue clay presented itself, embedding, in partial places, a large sprinkling of the precious metal. The cradles were of all sizes, and worked, principally, with a winch-handle projecting from the side. The tin pan is very common, and is used in most of the *canons*, as it is difficult to convey there any other implement. The *bars* are denominated the wet diggings; the *canons* are narrow openings between the mountains, some of them being a thousand feet in depth, while the cliffs rise on either hand as abrupt as though they had been recently wedged asunder. The *dry diggings* are commonly in the gulches and ravines of the mountains, and the gold has sometimes to be taken to a considerable distance ere it can be thoroughly washed and seperated from its accompanying matter. The white and yellow veined quartz, which is perceptible in some spots as an out-cropping, contains the small lumps, specks, and spangled strings of gold, which can be picked out with a common sheath-knife, but it is rare to obtain much in that way. The face, the hair, the brows, the eye-lashes, and the whole person of a miner are covered with the red sand, when working in the dry diggings; some of the miners adorned their persons with India-rubber aprons and used boots of the same material, but the best suit for all purposes of mining industry is made from deer-skin, with the common boots of fishermen.

"At James's Town, as they call it, at the south mines, there were about thirty huts in a finished state, and more springing up. The bed of the river was nearly dry, and the surrounding knolls and cliffs were covered with a dwarf fir, here and there intermingled with small and gnarled oaks. There we observed the usual features of mining industry—carts, mules, and oxen; picking, digging, and washing. At Placerville (Hanctoun) there were about seventy or eighty wooden huts, or shanties, in all manner of shapes and sizes. This Placerville is embedded in a hollow square bason, whose sides are formed of rounded hillocks of sand, which are sprinkled over with the dwarf fir.

The stream zig-zags through its centre, and there the diggers were earnestly at work. A covered wagon, drawn by three oxen, had just arrived with a good store of commodities, and was eagerly surrounded; there was also another feature worth noticing in this embryo settlement—one Albert Bee had established a lithographic press, which could scarcely answer in such a place.

"The most flourishing mining settlements, however, that we observed, were those of Marysville and Downieville. At the former we especially remarked the signs of rising wealth and importance. On the *Plaza*, as it is magniloquently called, there is the *Hotel de France*, the *People's Hotel*, and *Yuba Hotel*, and in immediate proximity is the auction room of *Parish* and *Adams*, where almost everything was disposed of. There, in short, a whole side of imposing buildings met the eye of one kind or other; and in the centre of the *Place*, several directions, nailed to the trunks of two large trees, attracted attention. On a couple of large boards we observed—*Plans for Damning (?) the Rivers*, and *Hay for Sale;* on another—*Notice*, no *Diggins on these Banks;* and, on a fourth, in perfectly legible characters—*Apples, Oranges, and Whiskey. Board and Lodging—Now or Never*, was equally conspicuous; while on the stream, which skirted the opposite side of the *Place*, a barge was hauled half-way out of water, which announced that *Martha Ruffin* supplied *Teams for all the Mines*, sold *Groceries*, intimating also that the *Taxes were paid*, which, for the soul of us we could not comprehend. Another boat, lying close by, was called the *Refugia for Sacramento*, which was painted in good sized letters on her sides. The 'Stars and Stripes' was floating over the barge, and also on the roof of one or two of the buildings on the hill.

"The general method of gathering the gold throughout all the diggings was rather of a slovenly nature, and cannot be called effective, inasmuch as the 'leavings' of several of the washers would repay a more practical application of labour. Quicksilver was seldom used, although it proves so effective in separating the metal from its associate matter; in one instance, however, we observed that it was employed upon the old and

wasteful plan. The quicksilver was simply poured in amongst the black sand and stirred about with water until it was supposed to have drawn all the particles of gold to itself, then the amalgam was placed in a buckskin bag, and compressed with great force, until the quicksilver oozed out through the pores of the latter, which must have caused considerable waste. An expert hand will effectually wash a panful of auriferous dust in ten minutes; but the cradles are the best implements, if the term may be allowed, as they can employ the labour of four hands continuously. The yield of a panful ought to be in value about a quarter of a dollar, or it is scarcely worth the labour bestowed upon it, as a miner at that rate can merely earn about twelve dollars per day, working eight hours. The only class of diggers that are likely to hold out, and do pretty well, excepting, of course, those who chance to drop on a rich 'pocket' or so, are such as have been accustomed to heavy work, analogous to that of mining. The frame that can endure the extremes of heat and cold—that is not over-nice as regards diet, wet feet, mud, water, and roughness of fare in every sense of the term, will be the only one to endure the trying climate of California, while engaged in such a laborious pursuit. Hard bread, salt junk, bad water, in nineteen cases out of twenty, execrable spirits, and the almost constant presence of a highly deleterious atmosphere, are the ordinary concomitants of a gold-finder's existence in these trying quarters of the globe; and the ultimate gain, even limited to £. S. D., is not so highly remunerative, when calculated on the average of those who are in pursuit of it. What are eight, or ten, or twelve, dollars per day, with living proportionately high, when weighed against the ugly incidents here faintly enumerated?

"The *morale* of the miners may be readily imagined. It would require the deep colours of a Rembrandt to convey an adequate notion of its real nature. Drinking to excess, ferocious oaths, brutal threats, and in every way disgusting and degrading actions, are of frequent occurrence; and with sudden riches in his possession, after smarting, perhaps, for the greater portion of his life under poverty and privation—with the excitement of brandy and wine which he could never hope to indulge in—

what could really be expected? With the grains that fell from the pockets of some of these men, many would deem themselves really rich, for it was no uncommon sight to see miners rolling about in a beastly state of intoxication, with thousands of dollars of 'dust' about their persons, which they picked out in payment for what they wanted in the most slovenly and wasteful manner.

"One word on the climate. The extremes of heat and cold are very trying. From about nine in the morning till five in the afternoon, the heat is excessive; the rays of the sun pour down into the valleys and *canons* through a dry clear atmosphere without the slightest mitigation; the thermometer generally was at 90° Fah. at noon, in the shade, both at Culoma Valley and on the Yuba; and at night the cold in the tents, in spite of being clothed, and wrapped up in blankets, was piercing in the extreme. In the months of June and July the thermometer stands at 109 and 112 in the shade. The cold from the mountains is excessive, and the water, after leaving its icy source, rushes down with such great velocity, that it has scarcely time to become tempered, ere its flow may be said to have ceased. Fevers, dysentery, and agues, were the ordinary climatic enemies of the miners; and these, which are incidental to the locality, and are almost sure to afflict even those of temperate habits, are fearfully aggravated by intemperance and excess. The best cures are a little calomel, a slight dose of quinine, or Peruvian bark. Some were foolish enough to try cayenne pepper, but they paid, in most instances, terribly dear for their folly. Epsom salts are not bad to clear the system, after being choked up with salt meat, queer coffee, and villainous spirits; but the best preventive, after all, is temperance in diet, and especial care in boiling and cooling your water for drink.

"On my arrival at Francisco, after a tedious sail in a schooner from Sacramento, I found our captain with only two men in the ship, and they were ill, or, doubtless, would have decamped like the rest to seek their fortune at the diggings. The captain, however, had done a pretty good stroke of business in his own way, which somewhat diminished the otherwise irksome and unprofitable nature of his position, for he was in a most un-

comfortable plight, with half a cargo of oil on board, and the interest of the owners of the vessel intrusted to his charge. But as he was helpless, and could scarcely hope to relieve himself, he took things very quietly and made up his mind to await the chances that turned up in his favour. Such being the state of affairs, I at once determined to pay the southern diggings a visit, and see with my own eyes whether the riches of the Mariposa, Mokelemy, and Sonora deposits, were equal to the common report. The Mariposa and its tributaries comprise a portion of land which is reputed to be very rich in auriferous deposits. The valley through which the river runs is about thirty miles long, and varies in breadth from eight to fifteen miles. On reaching Stockton, we had a further journey of about ninety miles to make the point we were aiming at, and where a party was established with a crushing-machine to extract the gold from the quartz. This property belongs to Colonel Fremont, who has let off portions of it to certain mining companies, not one of whom will have the power of working it, unless they buy off the present settlers, for there is no law of settlement in California analogous to that which obtains in the United States, or in our own colonies. The first squatter, if he thinks proper to retain his holding, is in no apprehension of a law of ejectment being applied to him; and, although the Colonel has obtained the concession of the Mariposa District from the United States Government, it is by no means clear that they will enforce that grant by executive authority. Indeed, the contrary opinion prevails, as the government in question are too politic to enforce their authority without the prospect of an adequate advantage, and it matters little to them whether the Mariposa District, or any other portion of California, be occupied by the present settlers, or by the parties to whom Colonel Fremont may have conceded it, so long as they perform the several duties of citizenship as recognized in other parts of the Union.

"Here, however, permit me to indulge in a few geological remarks upon the Sierra Nevada,—not upon any one district, but upon the condition of its general range. The snow-capped peaks of this range suggested to the Spaniards the name which

it bears.* The geological structure of the Sierra resembles the Andes, in being one continuous ridge, instead of a chain of ridges, like the Appalachian range east of the Mississippi. Granite appears the prevailing rock near the summit, and it may be presumed that this and other igneous rocks reach some distance down the flank of the mountain. The whole have been elevated to their present position by forces beneath; but the nature of these forces, and their immediate cause of action, must be left to conjecture, or to the future demonstration of geological science. On the western flank of the range there may be observed large masses of metamorphic and hypogenic rocks, which stretch from the valley of the Sacramento to the axis of the mountain, having an average slope of 180 feet to the mile, which gives a great fall to the streams that issue from its side. The ravines are occasionally of enormous depths, from the rapid and disintegrating power of the streams, reach-

* The writer of a very interesting book (*The Curiosities of Industry and the Applied Sciences*, by George Dodd) has committed a strange blunder in describing, or rather in attempting to describe, the geographical features of California. He says:—"Between the Rocky Mountains and the ocean there is another mountain ridge, parallel with the coast; there is thus formed an *oblong basin or valley between two ranges*, nearly north and south; and for a distance of nearly 600 miles, the rivers of this valley have no outlet whatever, except at San Francisco, where a gap occurs in the coast ridge. It is thus that nature has made San Francisco an important place, independent of the gold question. This harbour is about in latitude 38°; the Sacramento flows southward along the basin or valley at this point; while the San Joaquim flows northward to the same meeting-place—*the two rivers having numerous tributaries which drain the Rocky Mountain region.*" So Mr. Dodd completely obliterates the Sierra Nevada, and only sees on the map the Rocky Mountains on the one hand, and the Coast Range on the other, and, consequently, makes the great basin and the valley as one, just lying between these two ranges; and the rivers, too, as a physical necessity, and by way of preserving a geographical harmony, are made to flow from the greater of these ranges. Suppose, however, we follow nature, and place the Sierra Nevada between the two ranges of Mr. Dodd, then what will become of his geographical precision as to basin, valley, and rivers? In brief, the "basin" lies between the Rocky Mountains and the Sierra Nevada, and the streams which flow through it are the Green River, the Humboldt, and the Rio Colorado, which empties itself into the Gulf of California, while the former take nearly the same course, though Mr. Dodd seems entirely forgetful of their existence. The "valley" lies between the Sierra Nevada and the Coast Range, while the Sacramento and San Joaquim have their rise in the western sides of this range, and pour their respective waters into the head of the bay of San Francisco.

ing, on some of the branches of the Americanos, upwards of 3000 feet; and these streams are sometimes intersected by smaller tributaries, which divide the separated range into isolated groups of mountains. The features of these rocks are generally composed of slates, protruded by hypogenes; the slates containing numerous veins of quartz, which are more or less metalliferous, and are the ordinary *matrices* of the gold. The low rounded hills that constitute the eastern border of the Sacramento valley, near the Bear River, are thickly covered with diluvial drift, consisting mainly of sand and loams, mixed with jasper, prase, basanite, and other silicious pebbles. As you recede from the valley, the trappean variety, similar to basalt, and of a compact structure, everywhere meet the eye, especially on the sides of the ravines, the hills generally retaining their diluvial covering. From Bear to Yuba River slates prevail, with trap protruding through them. The quartz in this formation is frequently met with, outcropping on the surface. These trap rocks, especially near the Yuba, contain epidote, actynolite, specular oxide of iron, and also quartz crystals. The Yuba is a perfect torrent in the rainy season, and runs through narrow chasms, or ravines, which it has formed in the mountains, until within twenty miles of its junction with the Feather, where its course becomes smoother, and its banks loosely covered with the large boulders which have been washed down in its course. These boulders serve to detain the sand and gravel, which otherwise would be swept away by the periodical floods of the river, and it is principally in these places that the large nuggets of gold are found. On passing the southern branch of the Yuba, the prevailing rock is trap and slate. In some instances sienite has replaced the trap, and continues, in connection with the slate, to the river's edge. In the ravine of the South Fork, whose declivity is 3000 feet below the summit of the adjoining highlands, alluvion, with huge boulders of hard hypogene rocks, indurated slates, and fragments of quartz, abound. For several miles south-east of the Bear River, the rocks are commonly trap and porphyry, slates occasionally intervening, with here

and trap, after which slates prevail as far as the north Fork of the Americanos river. Boulders, ravines, strips of alluvion—slate, trap, and porphyry—are the usual phenomena in the forks of this, as of the preceding rivers. Here, also, is situated the 'Spanish Bar,' whose sands and gravel proved so highly auriferous; and there, likewise, is the locality of Captain Sutter's mill, where the first discovery of gold was accidentally made. Columa is already a thriving place, and will become the centre of a considerable trading community. From hence to Sutter's Fort there is a wagon road, which leads over the highlands.

"The same features, with slightly varying exceptions, characterize the range of the Sierra Nevada in the neighbourhood of what is called the Southern Mines. The occurrence of quartz veins in slate, penetrated by trap, porphyry, or other igneous rocks, is a sure indication that the precious metal is more or less disseminated through their mass. The Mormon Gulch, for example, which proved so highly auriferous, and Holden's Garden, which was equally so, lie very near the veins and outcroppings of the range which exhibits these several features. And this leads us naturally to the subject of veins, and the auriferous contents of the quartz especially. The question assumes this form—will quartz veins, as they are called, pay for working?* This question involves one or two points which must be considered separately. First, the character of the veins. In mining operations, the largest share of attention has been bestowed upon what are called 'deposit veins.' In several instances these veins are composed of rotten quartz, which crumbles at the touch, and may be termed a light-reddish brown colour; but few of this class of veins are rich enough to repay the labour expended upon them, although we must except the Gold Tunnel Mine in the north, where this kind of quartz prevailed, which proved highly auriferous.

"The general character, however, of deposit veins, is a hard

* *Vide* an interesting little volume, entitled the *Chemistry of Gold*, by J. Scoffern, M.B. We allude more particularly to the physical properties of the metal, and the industrial purposes to which it may be applied. There the manufacturer, as well as the "digger," may gather instruction which both may turn to profitable account.

white, yellow, pinky quartz, which occurs at intervals, and sometimes accompanied by decomposed and honey-combed rock, but the quality, or rather the quantity of the precious metal, in these veins, is purely accidental, and seems determined by no particular law. In some few instances there is more gold than quartz; in others the rock has yielded from 30 to 50 cents per pound, which would pay well for working; but in many instances the valuable contents of the veins are much below that amount. When, however, the vein appears remarkably rich, it soon becomes exhausted, which occasions a great loss if it be worked throughout, as the gold is simply aggregated upon the surface, while almost all beneath is useless rock. The mines in the Bear Valley may be cited as an illustrative example, to which thousands flocked, from the circumstance of gold being found on the surface, and in the quartz, besides pieces detached by decomposition from the vein. When the decomposed rock was pulverized, and properly mined, it was found to contain scarcely any portion of the precious metal.

"The mines of the north—one or two of which are being successfully worked by companies—are characterized by a hard, white, and yellowish quartz, which seems more spangly than that of the south, and not likely to yield so many little lumps as the latter. The average per ton of this quartz is from forty to sixty dollars, and where it yields £20 per ton it must be considered as a rare prize in quartz-crushing. Nevertheless, these deposit mines, as they are called, are extremely hazardous.

"There is a class of veins, however, which are well deserving of attention, and whose qualities are known to few besides practical miners; yet these are by no means infrequent along the range of the Sierra, especially in its southern portion. The contents of these veins are generally coloured, sometimes red, brown, blue, green, or grey, according as iron, copper, sulphur, arsenic, or silver happen to prevail. These veins are often richer below than above; for, at the surface, and even down as low as ten or fifteen feet, they exhibit little more than common quartz, which indicates extreme poverty. But descend a little deeper, and the refuse quartz begins to diminish, while at a

depth of fifty feet it will entirely disappear. The ore then assumes a dark green or brown colour, and occasionally sparkles with gold disseminated in minute particles over the whole surface of the rock; after which it remains pretty steady, and a good auriferous extract, by the process of quicksilver, may be obtained. The value of this kind of ore on the average is about three cents to the pound, or six dollars per ton. These rocks, however, like many others on the southern range, require calcination.

"We have already remarked that the valley of the Mariposa, which is generally considered the richest and most auriferous in the whole range of the Sierra, is about thirty miles in length, and from ten to fifteen in breadth. The quartz formation appears at the head of the valley, in two great divisions, the one dipping in an easterly and the other in a southerly direction. Both divisions disappear, but occasionally crop out, and, after throwing off numerous tributaries, again take the form of separate lodes. These lodes, at their out-crops, vary in thickness from one to ten or twelve feet, and assume a position inclining from the vertical to fifty or sixty degrees. Very little of the district, as yet, has been thoroughly examined, but quite sufficient to prove its general richness in the precious metal. The quartz is frequently embedded in soft slate and talcose rock. The veins vary in richness, but where the precious metal prevails, or even shows itself in its ordinary state, they will yield by amalgamation, from thirty to fifty dollars per ton with scarcely an exception,* although not one, as yet, has been worked, or examined, to a depth of sixty feet.

* The veins of the Mariposa District are confirmed by an authority, whose judgment few will venture to question. "Two months later," says Mr. Tyson, in his valuable Report, "Colonel Fremont informed me of his having removed the outcrop from a vein of quartz, which he described as being in slate-rock near the Mariposa river, and showed a specimen of the quartz containing gold from the river, thus verifying the correctness of previous inferences. The specimen consists of a fragment of angular, and *not water-worn*, quartz, much discoloured by peroxide of iron, which has undoubtedly resulted from the oxidation of sulphuret of iron that formerly filled the cavities left in the quartz. There was a large proportion of gold disseminated in small masses throughout the stone. This was taken from the vein near the outcrop; but it will be found, in penetrating beyond the influence of atmospheric action, that the gold will be usually accompanied by iron pyrites."—J. W.

"The quartz, in general, is extremely hard, and, after being calcined and reduced by stampers to the required fineness, the gold is usually found with silver, copper, iron, or sulphur, in small quantities. At Quartzburg, and at Burn's Ranche, where mining operations have been partially active, the veins improved downwards, and fair results obtained. In the vicinity of Sonora the veins are both numerous and rich, but equally capricious as to their yield of gold; but the Fortune Company's mine, situate at the back of Sonora, the property, we believe, of Cornish miners, with its decomposed quartz, and its cross-thread of rich metal, has proved the most successful. These miners are said to have sunk some deep shafts with lateral galleries, so that they can work the vein with some effect; but, from want of capital and adequate machinery, the usual *desiderata* in the mining districts of California, the required results have not yet been obtained. Throughout the whole of this district the veins are imbedded in slate, talcose rock, limestone, granite, and clays, having almost every degree of inclination in their dip.

"The next point to be considered is the locality, which, to be advantageous, should unite three requisites—namely, easy access to a trading town, if for the sake of transit only, a good supply of water and fuel, and, thirdly, as near the base of the mountain range as possible. The first object in veins ought to be economy in labour, and this cannot be so effectually preserved with mining works at a considerable altitude in the mountain, or a distance from the nearest trading town; and if there be a deficiency in water or fuel, the expenses must necessarily be augmented. All these difficulties may be obviated, at least partially, by a little practical judgment, for the district in which the gold abounds has one or two roads for conveyance to Stockton, and thence to Francisco; and as regards water and wood, the first may be acquired and retained by artificial means, which are always requisite in mining operations, and the last abounds in the plains, and on the mountain sides, in the form of dwarf oak, or in the more valuable one of white-pine or red-wood.

"But the grand requisite, after all, is effective machinery, if

crushing the quartz is to be carried on to a profitable result. The machinery hitherto employed is, in general, cumbrous, antiquated, and ineffective Neither the Mexican, nor the Chilian mode of working ought to be adopted in California, as the *erastero* and the *trapiche*, although in unison with the bygone habits of those people, are not sufficiently effective for the present day, in a land abounding with the keenest and most active powers of the human mind. The Mexican roller, for instance, would have little effect upon the quartz of the Sierra Mines, which, even when calcined, is almost as hard as the metal the rollers are made of; the friction, moreover, would soon reduce them to an ineffective state, as the iron is not sufficiently tempered to endure the wear and tear of such trying work. The Chilian mill, with its duplex movement, might prove more effective, as revolving cylinders on the same principle could be used with advantage, if properly constructed. The *stamper* is the only machine, as yet, in general use in California; but there is a considerable loss both of power and of gold, by this process of crushing. As capital flows in, however, the varied *desiderata* will be found, and, if capital be judiciously applied, there cannot be a question that it will repay a more than ordinary rate of profit."

We fully agree with our friend that more skilful machinery, such, for instance, as that used in the mines of Russia and Schemnitz, would prove highly advantageous in California. But this kind of machinery can only find its way to the mines when the "placers" and "diggings" shall begin to diminish, and labour finds something like a natural level. Capital and labour cannot be applied upon anything like a healthy and enduring principle, so long as the present condition of things shall last, which partakes more of the spirit and excitement of gambling, than of a permanently remunerative, and steady pursuit. The machinery in ordinary use in the Siberian mines, and that employed in the mines of the Ural, could be effectually used in California, as the general detritus and rocky materials of each, correspond in almost every particular. Walker's cylindrical sieve, for instance, so efficiently used in the Ural mines; and the sorting-drum employed at Schemnitz, which

separates, by a simple arrangement, four different sizes of materials, so that by a two-horse power, and the labour of a couple of men, ten or fifteen tons of mixed ore and stones can be operated upon in a single day.—Again, there is the ingenious gold-washing apparatus of Agté, in use at the mines of Alexandrowsk, which, with the aid of four men, employed in "charging" and "picking," will operate upon thirty or forty tons per diem.

We cannot, however, condemn so unceremoniously the Chilian *trapiche*, which, in the absence of the skilled machinery just mentioned, might be effectually used in California; and, though our friend may hold it as the lowest amongst skilled machines, it unquestionably occupies the first place amongst comparatively unskilled machinery. Let us describe the machine in question:—the *trapiche*, or mill, more properly speaking, is of a very simple construction, and comprises two stones, the lower stone being placed in a horizontal and the upper in a vertical position. The horizontal stone is about six feet in diameter, and has, near its circumference, a groove of eighteen inches deep, in which the ore is placed; through the centre passes a perpendicular cylinder, connected by a cog-wheel, turned by water. The vertical stone is about four feet in diameter, and ten or fifteen thick: and is furnished with a horizontal axis, which permits it to turn freely within the groove. When the ore is sufficiently pulverized, a proportionate quantity of quicksilver is added to it, which is immediately amalgamated with the gold; to moisten the mass, and incorporate it more fully, a small stream of water is directed above it, which also serves to carry off the amalgam into reservoirs, placed beneath the stone. The gold combined with the mercury falls to the bottom of these reservoirs, in the form of whitish globules; the mercury is next evaporated by heat, and the gold appears in its true colour, and in all its brilliancy. In each of these mills upwards of two thousand weight of ore can be daily ground and amalgamated. This mode of extracting the metal is simple and effective, but, of course, must give place to the skilled devices of the present day.

One word, ere we close this chapter, upon the weights of the different lumps found in California, and also upon the annual yield of the diggings and mines, which is naturally attracting much attention.

According to certain statements, no doubt greatly exaggerated, there have been found lumps of gold of the respective weights of ninety, fifty, thirty, or twenty pounds troy; but whether these were solid *native* metal, or had been produced artificially, by melting up quantities of the gold, as ordinarily met with, or whether they were pieces of quartz, containing fragments or scales of gold, we are left in the dark. We have before us the returns of the United States Mint, which gives the following statement:—

By Lieutenant Beale, ...	6 lbs. 9 oz. troy.
Mr. Mickle, ...	9 ,, 7½ ,,
Mr. Perkins, ...	14 ,, 6 ,,
Mr. Post, ...	5 ,, 7 ,,

For the sake of comparison, the weight of large lumps heretofore found in other parts of the world are given as follows:—

At La Paz, in Peru, ...	59 lbs. troy.
In Sonora, Mexico (Humboldt), . .	48 ,, 6 oz. ,,
In Siberia, (do.) . .	27 ,, ,,
In Cabarras Co., N. Carolina, . .	28 ,, ,,
Do. do. . .	13 ,, ,,

To which we may add the lump recently found by Mr. Kerr, in the Turon Diggings, New South Wales, which is reported to have weighed 110 lbs.

The composition of the gold of California, as compared with the productions of other mines, is thus stated in the document to which we have referred:—

	Maximum.	Minimum.
California, ...	95·70	81·20
Siberia, ...	98·96	28
South America (New Granada, &c.),	88·58	64·93

The Mint returns, as to the quantity of gold received for coinage, furnish some interesting data, which will serve to elucidate the question as to the productive power of the mines:—

		Dollars.
To December 31st, 1849, at Philadelphia, . .		5,525,616
„ „ New Orleans . .		666,079
		6,191,695
From January 1st to September 30th, 1850 :—		
At Philadelphia, . . .	19,271,463	
New Orleans, ...	2,4958,24	21,766,711
Aggregate to Sept. 30th, 1850, . . .		27,958,406

A foot-note is appended, stating that "the total amount received, from the discovery of the mines to October 31, 1850, was 31,838,079 dollars. The deposits of the current month (November) will probably advance the total to thirty-six millions.

The *San Francisco Herald* of the 15th June, 1852, gives the following statement of the quantity of the precious metal shipped from California, which presents some curious features:

The total shipment for June will give, for the first half of 1852, 19,281,448 dollars. This is at the rate of 38,562,896 dollars for the year. During the year 1851, the deposits of Californian gold at the Mint amounted to 55,938,232 dollars, being 17,375,336 dollars more than the sum estimated for the present year. In a subsequent chapter we shall indulge in a remark or so upon these returns, which may probably serve a useful purpose. In the meantime, we shall resume the narrative and correspondence of our friend.

CHAPTER VI.

TRIP TO THE GOLD FIELDS OF AUSTRALIA.

"Launceston, March 15, 1852.

"I shall now briefly transcribe certain portions of my diary, in order that you may have a glimpse, as it were, of my movements since I last wrote you.

"Left San Francisco with a motley crew, principally Kanakas wishing to get to the Sandwich Isles. Some Sidneyites on board, eager to reach their homes after 'prospecting' in the Californias for the precious metal. Few successful; two had

about sufficient to carry them to Sidney; one offered to work his way, and did anything that was required of him. Not many, from what I could see and hear, had realized their expectations; nor was it to be expected, for thousands started to pick up gold, as though it were lying at their feet and simply required the bending of their bodies, little thinking that a considerable amount of labour—and labour, too, of a peculiar kind—is absolutely necessary to procure it. It appears to me, from what little I have seen and heard, that all the lazy, floating, ill-to-do fellows, in almost every part of the world—who all but starve in their own country—thought they should make amends for their comparative ill-luck, as they term their unsuccessful condition in life, by rushing to the gold-fields, and by securing sufficient means to make up for their preceding short-comings. There is, however, a physical, educational, and practical adaptation for almost every pursuit in life, and the very parties who seemed deficient in these several requisites were the first to embark in a pursuit which, above all others, required their peculiar application, and without which failure is almost inevitable. Gold-finding, least of all industrial pursuits that I am acquainted with, is no exception to the universally recognized rule—that there is no royal road to geometry. As they say in our law courts, in allusion to the prizes to be gained, 'many are callen, but few are chosen;' and if the remark holds good as regards the students of law, it is equally applicable to the generality of the gold-seekers. Mere luck, as it is vulgarly nick-named, must be excluded in calculating the results of such industrial pursuits, if, indeed, it ought ever to be admitted as an element in the solution of any industrial problem; then it will be found, unless we are greatly mistaken, that the successful gold-finders may be ranged under two simple categories—those who practically and energetically apply their labour to the pursuit, and those who shrewdly speculate on duly supplying their various wants.

"Reached the Sandwich Islands after considerable southing; heard, for the first time, of the gold discovery in New South Wales. Great excitement. Everybody wishing to go on board

our vessel. Considerable difficulty to find hands to work the vessel. At length reached Sydney. Discharged our cargo of oil. No hands to work the vessel down to the Aucklands. All off to the 'diggings.' Arrival of one of the company's vessels, the Samuel Enderby, from the Aucklands, with craters, shovels, iron bedsteads, pumps, railway bars, and wagons, wheels, &c., all of which are required in the plant of a whale-fishing station. She had on board upwards of a hundred casks of sperm, seal, and common oil, besides seal-skins. Surprised at a portion of her cargo, as it denotes a foregone conclusion. Mr. Preston, the secretary, had arrived out from England, and was down at the station * * * * * *
This, however, I do know, that there is scarcely a good field of whales to be found there, taking the season round. The 'fish' come higher up, where they are to be found in much larger quantities. Besides, it is difficult to get near the Aucklands for about nine months in the year, the winds blowing so steadily in a contrary direction, and with such a dead 'set' against the islands. It is no uncommon thing for a vessel to be right off the port for three weeks together, without even a chance of making the slightest approach to an entrance. Regret the turn that things have taken. Great desire to revisit the Auckland group, if it be merely to re-examine their geological features. The sketch I sent you corresponds exactly with the structural formation of several parts of Sierra Nevada, and I have not the slightest doubt but gold will be found there, the same as elsewhere. I have written to the secretary, Mr. Preston, to that effect, although I have not the pleasure of that gentleman's acquaintance. * * * * * *
If gold be discovered in the Auckland group,—which may be affirmed with almost the greatest certainty,—it will doubtless have the effect of determining their continued occupation, whether profitable for whaling purposes or not.

"Met my old friend B——, who kindly invited me to his residence in the Shoalhaven district, where he has one of the finest and largest establishments in the colony. He seems much aged since I saw him nine years ago. Is still a Member of Council, and, with the exception of ————, is considered one of the

most shrewd and practical minds of that body. Determined upon going by sea to Wollongong, though a little out of my way, as there is a good road from Sydney to the Shoalhaven district, through Campbell Town and Bongbong, leaving Appin on your left. On my visit to Wollongong nine years ago, I went by way of Appin, and through the bush, after crossing the Nepean barefooted, as there was not even a ford across the river at that time. Since, then, however, the authorities have mended their ways, although there is yet wanting a direct road to the Illawarra district, perhaps the most beautiful and productive of any in New South Wales.

"On board the King William steamer,—a little, cranky, and ill-conditioned tub of a boat. Left Sydney at 4 p.m., and reached Wollongong—the Brighton of New South Wales—next morning. Bad harbour,—difficult to approach; a great drawback to the prosperity of the place. Steamers are continually plying between there and Sydney, but the surf in general beats so heavily against the shore, that they are sometimes obliged to return without their cargo of live stock even landing. Walked round the town, and found it much improved since my last visit. Great number of public-houses for the size of the place, but chiefly dependent upon the settlers of the district, who make this a meeting for the sale of their cattle and the purchase of their commodities. The 'Marine' had supplanted the 'Royal' Hotel, as the leading place of accommodation, and instead of one Dillon, a tipsy Irishman, rejoicing in the occupation of landlord, I found a well-to-do Englishman, with a buxom wife and three or four rosy children to boot. The accommodation of the establishment was equally metamorphosed; in lieu of sleeping on an old sofa with a dirty towel to besmear your face with in the morning, you are provided with the cleanly comforts of an English country inn, and by no means at an immoderate price. Inquiring for my old friend, the Rev. Mr. M——, I found that he had paid the debt which we all owe, and which nature will require of us all one day or other. Peace to his soul! M—— was a kind-hearted, hospitable, and truly Christian priest; and well do I remember, nine years ago, acting as clerk for him, when he went to preach his monthly

sermon at the establishment of my friend B——, the first, and, in all probability, the last time that I shall assume so sacred a vocation.

"A good day's journey to Shoalhaven. Tramped it right merrily through a line of country of rich and varied wildness—flats, rivers, hills, tall trees, and tangled brushwood, alternating the scene. Nature is there arrayed in all her glory, and most luxuriantly displays her charms. The *Banksia*—I must give you a passing whiff of the flowers, imaginary though it be—with its orange-red cone, perfuming the air with a scent as delicious as that of the honey-suckle; the *Xanthorea*, or grass tree, with its sooty-coloured trunk, and its long, pendulous, thickset tuft of grass, from the centre of which springs a stem several feet in height, which is covered with small, delicate, white blossoms; and the Cabbage-tree, with its bright yellow and red-tinted flowers, profusely scattered over the foliage, and which, at sun-set, glitters like a mass of molten fire. Then there were the *Kennedias*, purple and red, climbing here, there, and everywhere; the *Arrogosanthus*, with its velvet-like, ruby stem, and the white, pink, and gold-tinted *Xeranthema*, peeping up in almost every direction, with their peculiar forms and their rich and brilliant hues. The birds—the stillness—the almost breathless quietude, and my utter loneliness, are left for you to depicture at your own convenience. Passed through Dapto and Jamboroo, and reached at length Kiama, which has grown into a pretty village; visited the crater of an extinct volcano, which the ocean, by encroaching on the land, has converted into a magnificent water-spout—a beautiful sight, and worth lingering awhile to look at. Reached Jeringong, which is still an inconsiderable village; then made my way over a rocky and winding country, which was thickly intersected with wood of singular richness and variety, and at length came out upon the sea-coast. Taking off my boots and stockings, and carrying them in my hands, I trudged along the beach for seven or eight miles, where the sand and the spent surges of the ocean proved a cool and agreeable carpet to walk upon.

"B—— received me in his usual manner. He is one of the

oldest settlers, and has accumulated a large property. Two of his brothers, and three of his sisters, followed him from Scotland; they are all in a flourishing condition.

"Launceston, March 1852.

"After leaving B——, whom I accompanied to Sydney, I took ship and came down here on a visit to our old friend G——, who is carrying on a large and thriving business as a soap-boiler and candle-maker, and who bids fair, in the course of a few years, to become what is called a 'man of substance.' But he has recently received a severe check, like many others who are dependent upon a steady supply of labour, which, to use a nautical phrase, has completely taken the wind out of his sails, and which, if it does not spring up again pretty quickly from the same quarter, will leave his little craft high and dry on the sands. There is but slight hope, however, at present that such will be the case.

"The fact is, that the recent discovery of gold at Bathurst and Mount Alexander, in the Victoria district, New South Wales, has completely turned this colony topsy-turvy. Launceston is almost deserted. G——'s men left him in a batch, although he was paying them from two to three pounds per week; three of them, moreover, had been with him upwards of eight years. The head boiler actually left a pan of soap half-made, and consequently useless, so anxious was he to be off with the rest, though a remarkably honest and industrious man up to the time of his running away.

"As G——'s men had all left, and as he had no chance of procuring others, although he advertised in the 'Cornwall Chronicle' repeatedly, and offered advanced wages, we made up our minds to visit the diggings, so soon as we had set matters a little straight. It being summer time, too, (November), he had plenty of stock on hand for his trade, which could easily be attended to by his uncle, who is too old and too well off, to be influenced by the general excitement which so violently seized hold of the public mind. We accordingly put ourselves on board the boat which sails weekly to Port Philip, and arrived there in due course, for the Van Diemeners think no more of a

trip across the Straits—a distance of 600 miles—than you would to Margate or Dover. In fact, they look upon the province of Port Philip as an adjunct of their own colony, having been the first to plant their flocks and herds in that settlement,—or, in other terms, as being the founders and settlers of that province. Most of the Launceston people have either brothers, sisters, or partners, both commercial and matrimonial, in some part or other of the Port Philip district, and several own a good portion of the property which has there so suddenly sprung into existence. In making the trip, therefore G—— had two objects in view; first, he was desirous of seeing the precious metal picked up, as I had described it; and secondly, he had contemplated a visit to Melbourne for some months, in order to complete a negotiation which he had on foot—namely, the purchase of a boiling-down establishment near that city, wherein 1200 sheep per diem were boiled down. Circumstances highly favoured the first object; but there was little prospect of the latter being realized, as there could be but a slight chance of procuring labour in the immediate neighbourhood of the prevailing excitement, when it was not procurable at 600 miles distance for his more immediate purposes.

"Stopped at Melbourne a couple of days. Lodged with Dr. Motherwell, Collins Street, a friend of G——'s. Visited the boiling-down establishment on the Yarra River, about three miles from the town. Nothing doing: all off to the diggings. Not even a servant of any kind to be got. Butchers in great demand, especially pork-butchers, who can earn as much as five pounds per week. Carts selling at fifty pounds a-piece, which a short time ago were not worth fifteen pounds; everything of a mechanical structure, and of a useful nature, excessively high. Off to the diggings. Reached Mount Alexander in a couple of days; the distance about eighty miles from Melbourne. Horsed it all the way; nothing but a blanket in the shape of luggage, besides a couple of shirts and half-a-dozen pair of stockings,—for, let me remark, there is nothing so conducive to health, especially in this climate, *as clean and cool feet*:—a luxury—indeed a decency—everywhere; here, in addition, an absolute necessity; so also I found it in California. Nothing like

grooming the *corpus* well from top to toe; dry friction is always practicable, when anything in the nature of a liquid cannot be obtained. A cool head, a mildly-toned stomach, and a moderately warm foot, with free perspiration—there is then little chance of physical ailments, but everything in favour of healthy and exhilarating enjoyment.

"What a sight! G—— perfectly bewildered for a moment or so. There they all are as busy as ants, and as silent as though they belonged to a dumb generation. Cradle-rocking—tin-washing—horse and cart and wheelbarrow—in short, every possible expedient for diminishing labour—was rudely hit upon and diligently applied. Provisions not so dear as might be expected. 'Mutton or beef' is the common cry in the morning by men who drive their carts down the diggings, and, being plentiful in the neighbourhood, is sold at moderate prices. Flour, 6d. per lb.; butter, 2s. 6d.; milk, 1s. a quart; potatoes 3d., and cheese 2s. 6d. per lb.; and 1s. for a very small quantity of brandy. Tea, tobacco, and sugar moderate, considering all things.

"Strolling down the Creek, called Friar's, which is about ten or twelve miles long, G—— stumbled upon his head boiler, who was as busy as a bee, with two or three others of the Launcestonians. As soon as the man caught sight of his master he slunk away; but, seeing the latter familiarly talking with his companions, he sidled up and began to manufacture something in the shape of an apology, which G—— cut very short by remarking—'The least said the soonest mended; you are not the only one by a great many who have run away from their work,'—and thus made a virtue of necessity. 'Have you seen Mr. V——, sir?' exclaimed the man. 'No,' replied G——: 'Is he here?' 'Oh, yes, sir, he's somewhere about, if he a'int on his lot higher up there. I spoke to him about an hour ago.' 'Where's T——?' 'He's very ill, sir; he's lying under the tent. I'll show you, sir.' We accompanied the man, and found his companion in a state of high fever, which no doubt had been brought on by excitement, drink, irregular hours, and sleeping too exposed. Gave him the usual dose—nothing like it—quinine, &c.

"Gold pretty equally distributed; easily found, but not, apparently, in great quantities. The aggregate findings may, however, make up a large amount. The metal is mostly found in a bed of blue clay, which is superposed by quartzy pebbles, red and yellow clay, earth and gravel. Pits dug to the depth of eight, ten, and twenty feet, to arrive at the clay; the superincumbent strata being pretty regular in the several creeks and bends of the river. Little, as yet, found in the rocks; the diggers being too busy in the alluvial deposits. One quartz vein above Friar's Creek has been worked for a few yards in the rock, but was not found so profitable as the beds and indentations of the Creek. One of the pieces, previously referred to,* was from this vein; the other was struck off the rock a mile higher up. The gold is generally diffused in the one, although the spangles are small; in the other there is no trace of the metal, yet both are apparently of the same structure, and clearly of a metamorphic origin. The gold, it is fair to assume, will not prove so plentiful as many people are sanguine enough to expect. The prevailing character of the rocks, in the immediate vicinity of the range, consists of ironstone, or indurated clay, with a large admixture of iron, and of sandstone coloured with iron, resting on granite. The granite and schists alternate with each other, and present in their dip an angle of inclination of about fifteen degrees. In some few instances could perceive the outcroppings of the metamorphic series, especially those of porphyritic structure, but the veins of a quartzy formation are not so predominant as might be anticipated. The sides of the creeks clearly indicate their formation, and exhibit the structural nature of the range; the disintegration of the silicious and quartzy materials has let loose the precious metal which they contained, and which has found its resting-place either in the beds of the water-courses or in the cleavage and fissures of the rocks.

"One word or so on the physical character of Australia, which will enable you to form something like a correct opinion of her ultimate development, and the extent of the means required to carry it out. The great and insuperable drawback

* Vide p. 28.

is want of water. Where rain falls only at one season in any quantity, and where during the rest of the year evaporation is constantly going on under the influence of a cloudless sky and a brilliant sun, there cannot be expected rivers of any magnitude, or tributary streams with a continuous flow of water. Irrigation, therefore, is out of the question, at least upon a scale adequate to supply the exhaustive powers of evaporation, which may be termed a constant quantity in Australia, as there are no physical agents to counteract and neutralize its effect. A great portion of the surface of land in Australia must ever remain in a barren state—just as much so, indeed, as the arid plains of India are, and from precisely the same cause. The tanks which are formed on the surface of the latter afford but a scanty supply of water for the purposes of irrigation, although the sums expended annually for keeping them in a serviceable state, irrespective of the cost of their structure, are very large, and prove a heavy item in the burdens which land has to bear in that country. The outlay of capital must be equally heavy in Australia, if, indeed, it were not more so,—for the droughts in the latter are more frequently recurrent than those which occasionally depopulate India; and experience has proved that the Macquarrie, which intersects so large a portion of the present settled districts of New South Wales, is more capricious in its periodical supply of water than the Ganges, for although the latter may fall below its usual level, and leave the plains of Bengal in an unproductive state once or so in a quarter of a century, the former is liable to present the same state annually, and is occasionally destitute of water for two seasons consecutively. Nor is this condition of water-supply in Australia confined to a single stream, but, if we except the Murray and the Shoalhaven, it is characteristic of them all. Cultivation, therefore, must be confined to the valleys and to the lands adjacent to the water-courses, which can only form in Australia, as elsewhere, but a comparatively slight portion of its aggregate surface; and when these portions become fully cultivated, and adequately peopled, it will be found that the anticipations of the whole land being covered with a thriving and populous community must be classed with

the Utopia which practical experience, guided by economical science, especially discards.

"The deduction, therefore, may be fairly drawn, that wherever water is deficient, there also must be restricted cultivation and a limited population. Take North America as an example. If any one had whispered in the ears of the first settlers on the sea-board of that great continent, who died off like rotten sheep from the effect of the malaria, or miasmatic condition of the land, something like the following—'that they ought to think themselves extremely fortunate in being placed in the midst of such rich and invaluable elements as produce fevers and ague, which required little more than industry and perseverance to convert them into elements of a highly beneficial nature; that the great basin of the Mississippi, upon whose fringe they were located, and of whose unhealthiness they so bitterly complained, would, with its rich diluvion, one day become one of the most flourishing, healthy, and highly-cultivated spots on the face of the globe—that, moreover, it would prove sufficiently productive to supply the great manufacturing staple of England, and, in short, that the industrial fabric of the latter would be mainly dependent upon it,'—how would those settlers have replied? 'Mad, sir, mad as a March hare!' would in all probability have been their reply, and they doubtless would have considered their prophetic communicant entitled to a free admission for life to a lunatic asylum. Nevertheless, such has proved to be the case; for when the price of raw cotton happens to rise a penny or so per pound, it frequently results that some thousands of hands are thrown out of employment in the manufacturing districts, and a consequent shaking of the whole industrial fabric ensues. England is mainly dependent upon America for the supply of the raw material which forms the basis of her gigantic industry, and America is indebted for this richly producing power to the affluence of her streams and the abundance of her supplies of water. It would be folly, or something worse, to make these observations to the present settlers in Australia, or to predict that she will become the exclusive source of supply of any single material for the manufacturing world some two hundred years hence, as

circumstances fully prove might have been made to America. Australia will mostly be confined to pastoral pursuits, which must keep her thinly populated, and limited in the production of wealth. In a country where it requires three or four acres for the sustenance of a single sheep,* and where the plough would be comparatively useless, it surely is not rash to affirm that the accumulation of wealth must soon arrive at its limits, and beyond that limit by no effort can it possibly go. Twenty or thirty thousand immigrants, at the utmost, would have been sufficient to supply the demands for labour, and, had immigration been confined to that limit, the prosperity of the colony would have been of a more healthy and enduring nature than can possibly result from the sudden and overwhelming flush which is now pouring into it from all quarters of the globe. Gold-finding will rapidly become an unprofitable pursuit, from the numbers who are rushing into it, and when those who are incapable of obtaining a livelihood in that way are thrown upon the ordinary industrial occupations of the colony, the supply of labour will far exceed the demand for it, and misery and destitution to thousands will be the result.

"But the most tender point in relation to Australia is the origin and structure of her social condition. The least said, perhaps, upon this subject, the soonest mended. New South Wales, however, may be said to be in a metamorphic state; she is casting off by degrees her old skin, and is quietly growing into another of a somewhat more healthy and wholesome condition. The mother-country ought not to throw her back while under such an interesting state of transition.

"The first stage of the present colony has been compared with the early state of ancient Rome, in which the community

* Count Strzelecki remarks (*Physical Description of New South Wales*) "that at least seven acres of pastoral land are necessary to maintain a sheep of the value of two shillings, and which, on an average, produces but two pounds and a half of wool." The Rev. D. Mackenzie, in his *Ten Years in Australia*,—a work abounding in practical information as regards the physical properties of the colony—says that, "by those settlers who have expressed the most unfavourable opinion of the capability of our pasture for grazing purposes, three acres have been allowed as the fair average for the support of one sheep."

was nothing more than an association of robbers and outlaws, but, there is this remarkable difference to be observed between them, the robbers and outlaws of ancient Rome were independent and free, while those of New South Wales were in a state of slavery more rigorous in principle than even a negro slavery in the West, because the labour and submission exacted from them was not merely considered by their masters as a right, but as a punishment also, which it was their duty to render effectual, both for retribution and correction. The great blunder committed in the outset was in endeavouring to construct a community of felons alone, which was to be continually increased by fresh accessions of convicts. The machinery of government, even in its most simple and orderly state, cannot be carried on without hands, and much less in a state of society almost exclusively composed of unruly spirits, who are to be kept under rigid surveillance and coercion, because the local government had no alternative but to select from this very class nearly all its subordinate functionaries. Public works were necessarily filled up by those convicts whose better education only rendered them the more dangerous as confidential *employés*. The frauds and robberies practised upon the government formerly were most enormous and audacious; and some of the largest fortunes realized by the *emancipists*, or their descendants, have no other origin but this. When the tide of free emigration set steadily in, about thirty years ago, the government were enabled in some measure to keep the felon population at arm's length; but the class to which I allude had acquired, as a body, great wealth, and became inflated with extravagant pretensions, so that the organization of such heterogeneous elements as the colony presented, defeated the most skilled and practical plans that could be devised. Nor, unfortunately, was the assignment system, which was now brought into full vigour, however well calculated in other respects to promote the progress of the colony, calculated to check the growth of the evil to which simple allusion has been made. In fact, it was through the facilities which existed of abusing the assignment system that transportation, instead of conducting the malefactor to a place of punishment, only opened for him a road to fortune;

and that we at this day witness the anomaly of the opulence and luxury of a rising colony being represented by a class, which our criminal legislation had intended should reap nothing from their labours in it, but privation and disgrace.

"Recent events, however, have once more stirred up from their depths the ugly elements which we have fully pointed out, and which were fast sinking into a state of comparative quiescence; the colony has nearly passed through the fiery furnace of felonry, if we may be pardoned the phrase, and it is now threatened with the renewal of the evil, although upon a smaller scale. The mother country, in short, is prescribing a homeopathic dose of the drug, which, formerly, was taken wholesale; but as the stomach of the patient thoroughly refused it in that shape, it is not likely that it will receive it in any other, however modified it may be in quality or taste.*

"A word or so to the immigrants. Whoever comes to this new world, if he means to succeed in it, must resolve, in a great measure, to become a new man. He must make up his mind to dispense with most of the indulgences, and to discard from his memory most of the conventionalities to which he had been accustomed, and to reconcile himself to the simpler pleasures, and the ruder manners, of a more primitive life. The man who can thus break through old habits, and divest himself of old social prejudices, is crowned with a force of character which would enable him to make his way anywhere, and in Australia will certainly carve out for himself a sure, though somewhat rough, road to fortune. You, for instance, considered as an immigrant, may be classed as a capitalist; but you would make a very great mistake if you looked for all the exemptions here which the capitalist is entitled to in England. The province of capital with you is simply to keep labour in motion without any further effort than that of vigilant superintendence; but here the capitalist must make up his mind to set the example of labouring himself, and, indeed, to consider himself as little better than the foreman of the persons in his employment. He must not expect to say 'do this,' and see it done, but must

* *Vide* some able articles in the recent numbers of the *Spectator* on this subject, and especially on labour in the Australian colonies.

direct how it is to be done, and also lend a hand in doing it. We must remember that, in a new country, labour, instead of being the slave of capital, is itself the most valuable species of capital, which never ought to be allowed to remain idle and unproductive for a day, In England, where labour of every description is plentiful and cheap, it would be bad economy in a master to endeavour to save the wages of a labourer by labouring himself, to the neglect of that general superintendence, by which he is able to save incalculably more; because there the division of labour is carried so far, that without his superintending head to direct and control every branch of it, there would be endless irregularity and waste. But, in a new country, where there is little or no division of labour, the best sort of superintendence is that which is ever present in participating in the work to be done; and it is obvious, moreover, that it is of the utmost consequence to the employer to fix the scale of labour by the example of what he is capable of performing himself."

CHAPTER VII.

EFFECTS OF THE INFLUX OF GOLD UPON THE STANDARD OF VALUE.

"Il servire la moneta d'oro de misura universale e regola perpetua nei prezzi dei cambi, come si dimonstra col Corso dei cambi della piazza de Milano et con quello di Genova, et con la pratica mercantile piu communemente ricevuta et chè sino all' anno 1657, fu per tutta l'Europa inviolabile."—*Pompeo Neri*, t. v. p. 63.

"L'or, qui n'a jamais été de prime abord, dans aucun pays, la règle des valeurs, a fini par déposséder l'argent de cette fonction, dans les contrées les plus industrieuses, les plus riches, et les plus avancées."—Leon Faucher, *Recherches sur L'or et sur L'Argent.*

HERE we have the authority of one of the earliest writers on Financial Science that gold was the Standard of Value up to the middle of the seventeenth century; and, by implication, that it gave way to silver, when the American mines had inundated the European markets with that metal. We have,

likewise, the authority of a distinguished modern, whose *Researches* into the subject of the precious metals must be ranked amongst the most valuable of economical contributions, that gold has generally superseded silver as a standard of value amongst the richest and the most civilized communities. Let us see whether England has been wise in adopting, and adhering to, her standard of gold.

In the preceding chapters of this little work we have treated of gold as a commodity, and have endeavoured to trace that precious metal from the mine to the mint, from the earliest period to the present time. We shall now treat of it as a measure of value, and as we have no desire to complicate the question with hypothetic assumptions on the subject of the currency, which we have endeavoured to dispose of elsewhere,* even if space permitted, we shall content ourselves with simply prefacing our observations with a few economical axioms, which are generally received, and which, perhaps, will enable the reader to follow us with greater facility.

Standard of Value.—All things, as articles of commerce, are subject to a comparison with each other—first, as regards their *length*, or *superficial content*, or *volume*; secondly, as regards their *weight*; and thirdly, as regards their *value*.

The only way by which they can be compared, at least conveniently, is by comparing each of them with some fixed and invariable standard of measure, weight, or value.

Now, with an invariable standard measure of length we are acquainted, because a pendulum of given length will beat the same number of seconds in the same latitude all over the world. Hence a pendulum that will beat seconds in any given latitude is of an invariable length, and any part or multiple of that length is also invariable. A definite part of the length of a pendulum which beats seconds in a given latitude, we define a yard, and by this *standard measure of length*, we compare the length of all other things.

From hence it is also easy to perceive how we obtain an invariable standard of *superficial content and volume*, in the square foot or square yard, and cubic foot or cubic yard.

* *Vide* True Action of a Purely Metallic Currency. 1848.

Again, it is found that a cubic foot of distilled water is always invariable in weight; and a certain part of this we define to be a pound, and so have an invariable *standard of weight.*

But nothing whatever presents us with an invariable standard of value, because there is nothing which is invariable in value itself. Be it what it may, its value is not fixed by any law of nature,—as is the length of a pendulum beating seconds in a given latitude, or the weight of a determinate portion of distilled water,—but depends more or less upon extraneous circumstances. And an *approximation*, therefore, to an invariable standard of value is the utmost that we can by any possibility arrive at.

Our object, then, if we are to fix upon any particular commodity, by definite quantities of which we are to express the value of definite quantities of all other commodities, is to select such a commodity for our standard of value as is least of all liable to fluctuations in value.

Now, every commodity varies in value, from time to time, according as the relation between the supply of, and demand for it varies. If we could discover a commodity of which the existing supply would at all times be the same, and the demand for it at all times, and at all places, be the same, then we should have discovered a commodity whose value would always be the same, and furnish us with an invariable standard of value.

The properties of the commodities which come nearest to this ideal standard of perfection, as representatives of value would appear to be, first, that they should not be articles of consumption, as food, clothing, &c.; secondly, that they should be too costly, and otherwise ineligible for domestic use, or for working up for tools, machinery, arms, &c.; because the demand for commodities applicable to such purposes would always be varying, although the supply might remain the same.

Hence some one of the precious metals has been selected as a standard of value by all civilized nations; but whether gold or silver comes nearest to the ideal standard—*i. e.*, which is least liable to have its value disturbed by variations in the supply of and demand for it—is a problem as yet undecided.

Gold being the scarcer of the two metals, the supply of it is probably less variable than that of silver; but in times of war, on the contrary, gold is subject to far greater extraordinary demands than silver, for the support of marching armies, &c., because a thousand pounds in gold is only about one-sixteenth of the *weight* of the same sum in silver, and the difference in bulk is still greater in favour of gold being the most easy of transport.

We should conclude, therefore, that gold would afford the best standard of value in peace, and silver in war; but much disturbance would be occasioned by shifting from one standard to another.

As neither of these metals are by any law of nature strictly invariable in their value, still less can their value always bear an invariable proportion. If, therefore, a state invests one of them with a *fictitious* fixed value, for the sake of referring to it as a standard of value, and then *assumes*, for the sake of interchanging them, that a given quantity of this ore is equal in value to a fixed quantity of the other, this assumption will frequently be contradicted by facts. Thus the silver franc is referred to as the standard of value in France, and $15\frac{1}{2}$ ounces of this silver is assumed to be equal to 1 ounce of gold; or, which is the same thing differently expressed, 25 francs and 20 cents are assumed to be on a *par* in value with our golden sovereign. But this assumed equality, we know, very frequently proves a fallacious hypothesis, and at times is disturbed to a considerable extent.

This arises from the fact, that although the supply of these metals respectively should at all times be the same, still the demand for them at all times, and in all places, might not be the same. In pressing emergencies, an extraordinary demand for gold, for particular purposes, might arise on the part of certain states, and those states would be inclined to give much more than $15\frac{1}{2}$ ounces of silver, rather than want it. Thus, when large military operations are undertaken, gold, from its more portable character, acquires a new value, and the governments standing in need of it will give a premium of three or more per cent. for it in exchange for silver. Or the distribu-

tion of the metals throughout the world might be disturbed by the currency operations of different governments, as took place when an extensive coinage of gold was undertaken by the States of Germany, and when the relative value of gold to silver was reduced in the United States of America from 15⅓ to 15 against 1. When such operations as these are on foot, gold, in all countries where it is not the standard of value—and it is nowhere the sole standard of value except in England—becomes an article of merchandise, and, relative to silver, fluctuates in value as such, according to the intensity of the demand for it.

Cost of Production.—Cost of production—the cause which decides the value of any other commodity—decides the value of the precious metals. If the labour of one man, employed for a year, could gather from the alluvial deposits say fifty ounces of gold, and, by equal exertion, gather, from labouring in the field, fifty quarters of corn, the corn and the gold would be of equal value, and a single quarter of corn would be worth an ounce of gold. If the same labour could produce, in the same time, one hundred ounces of gold instead of fifty, a quarter of corn would be worth two ounces instead of one, or the reverse.

Relative value of the precious metals.—The value of the precious metals, relatively to other commodities, *cannot* be fixed. It is subject to be affected by the same circumstances of abundance, scarcity, supply, or demand, as affect the value of all other commodities. If the relation between the supply of, and the demand for, commodities was fixed and invariable, the variable amount of the circulating medium would determine the range of prices from time to time; and, on the other hand, if the amount of circulating medium was fixed and invariable, the range of prices would as certainly be determined by the variable relation between the demand for, and the supply of, commodities. Consequently, two causes of disturbance of prices, always co-existent, but not always operative at the same time, nor, when they are, always either co-operating with, or counteracting each other. Again, a sudden increase of the precious metals will lower their value in relation to commodi-

ties, and a sudden decrease will have precisely the opposite effect. The discovery of the mines of Mexico and Peru, for example, increased the general price of commodities four-fold, or, in other terms, decreased to one-fourth the value of the precious metals, when measured by commodities.

Depreciation.—The precious metals may be depreciated by a local alteration of the standard. If a state raises the *denomination* of its coin, or, which is the same thing, lowers its standard, the *real* value of commodities when measured by the coin will remain the same, as a less quantity will be given in exchange for it. The coin of Turkey, for example, has been gradually depreciated during the last thirty years, and the price of commodities has proportionately advanced; and the Spanish dollar is now worth twenty-two instead of three piastres, while the rate of exchange upon London has risen from twelve to one hundred and ten piastres. The same remark will apply to the depreciated paper of Russia, which, being inconvertible, performs the same duties, in relation to commodities, as the precious metals. The quantity of the paper currency was increased, between 1799 and 1811, from two to six hundred rubles; and the pood of rye-flour, as a consequence, rose from seventy to two hundred copecks. The silver ruble, in the meantime, attained the value of four instead of one and a half paper rubles, and the exchange upon Hamburgh fell from twenty-six schillings to ten. The Bank of England furnished a similar example of depreciation, when it enjoyed the privilege of being restricted from paying its notes in gold. The circulation of its notes, at one time, increased from ten to thirty millions, which caused prices to advance twenty-five per cent., and the precious metals to be exported. The value of gold increased from £3 17s. 10½d. to £5 5s. per ounce, and the exchange upon Hamburg, the then principal mart for bullion, fell from thirty-seven to twenty eight schillings for the pound sterling.

An Increase of the Stock of Specie is an Increase of Currency and not of Capital.—Specie, or a given quantity of gold or silver in the shape of money, is not only the common measure and common representative of all other commodities, but also

the common and universal *equivalent*, for it is of the essence of money to possess intrinsic value. The active capital of society consists in its productive stock, and the income of society in the produce arising from it. Money in a state of currency, therefore, can form no part of either the one or the other; its sole occupation is to exchange, not increase, the productive stock of society. A nation may be just as rich, nay richer, with a currency of fifty millions, than with one of a hundred. If a nation produced more with fifty than with a currency of one hundred millions, it would, in proportion to the excess, be more opulent; in that case, the fifty would be worth more than the hundred, as any given portion of the former would exchange for a greater amount of produce than a similar portion of the latter, and exchanging for more would be of more value. The currency of France, as compared to that of England, will fully illustrate this axiom. France, with a population of thirty-five millions, possesses a currency of £140,000,000;* while the British Islands, with a population of twenty-eight millions, possess a currency of only forty millions. The cause of this disparity is obvious—the general want of credit in that country occasions the use of money in exchange to be nearly ten times as great as in England. Money, moreover, is exclusively employed in France as a safe, though unproductive investment. The French peasant accumulates specie until he can buy a patch of land, the only investment which he believes to be secure. The English labourer, on the other hand, either expends all that he earns, or lends his savings to the Government, or employs them in a retail trade. Perhaps half the money in France does not change hands once in ten years; yet, though she has nearly three times as much money in proportion to her population as England, gold and silver are more than one-third dearer there than in England. It costs a Frenchman more labour to obtain two ounces of silver, than it costs an Englishman to obtain three; and if France could rely on internal tranquillity—if she would cease "playing at soldiers," or even leave the government *in esse*, in something like a peaceful state, whatever its principles or structure—if mutual confidence and commercial

* Recherches sur L'or et sur L'argent. Leon Faucher.

habits could be established among her people, sixty millions, or less, might perform all the operations for which 140 millions are now required. But, "il règne dans toutes les classes un amour exclusif de la richesse metallique," exclaims M. Chevalier,* and that intelligent economist proves that France pays very dear for her hobby. Of the 825,000 kilos. of silver produced annually by America and Europe, France has coined, since 1830, 360,000 kilos. or nearly half. The cost of coinage, according to the above authority, is nearly four millions of francs per annum. The passion for hoarding is also exceedingly great in France, arising, in a great measure, from her unsettled political condition. Contrast this state of things with that which prevails in this country. Here a small amount of coin is sufficient to become the media, or, at least, to balance the difference between the exchange of hundreds of millions,† as our whole system of banking, and commercial dealings, are specially framed to economise the use of money. But this system, so economical and yet so effective, can only obtain in a community where mutual confidence prevails, and where integrity is strictly and uniformly upheld.

Gradual Depreciation of the Precious Metals.—That the value of the precious metals has gradually decreased, especially since the discovery of America, is proved in several ways, and that they continue to decrease slowly and progressively is equally true. This, however, is an inconvenience, but not an injustice, to the creditor class, for all that they have a right to expect, all that their contract stipulates and the law guarantees, is, that the *quantity* shall be the same, and not that there shall continue an invariable relation between the *value* of that quantity and other commodities. A great deal of misapprehension prevails on this head, especially amongst currency writers (whose name is legion, and whose science, in general, is chaos), therefore it may be as well to simplify it. We do not give a *fixed price* for gold, as is commonly asserted.

* Cours d'Economie Politique, Neuvieme Lecon. Paris, 1842.

† We allude to the Clearing-house for the London Bankers, through which we believe, something like 1000 millions are passed annually without the intervention of coin, except to a very trifling amount.

We merely say, by fixing the standard, that a *conventional pound* shall mean the same thing to-morrow as to-day—the same thing a month, or three months hence, when I am to be paid for my goods as on that day I sold them. All the *fixity* amounts to this: A sells B certain goods to day for one pound *sterling*—that is, so many grains of gold when the day of payment arrives, or what is equal to it, a bank note, for which he can go and demand those number of grains of gold. The verity is, that a fixed *price* of gold only means a fixed *quantity*. The article itself, which forms this standing measure, never can rise or fall in value with reference to *itself*, for a pound weight of gold never can be worth a pound and a quarter of gold; and being divided into definite portions, an ounce of this gold, or one-twelfth of the pound weight, will always be worth £3 17s. 10½d. The truth of these propositions would not be affected by any imaginable increase or diminution in the quantity of gold in the country. By such an increase or diminution, indeed, the value of all other things (the quantity and demand remaining invariable) would be increased or diminished in the same proportion with reference to gold; but gold itself would still remain the *fixed measure* of the rising and falling value of all other commodities, in reference to each other.

Before we apply these axioms, however, to the present and prospective value of the precious metals, it will be necessary to give an estimate of the total quantity of gold and silver throughout the world in 1848:—

Silver . . . £1,208,000,000 Gold . . . £582,000,000.

whereas in 1500, antecedent to the discovery of the mines of America, it is stated that there were in

Silver . . . . £28,000,000 Gold . . . . £12,000,000.

so that the quantity has increased, in the course of three centuries and a half, by 1750 millions sterling.

The rise in the price of commodities during the same period, or *pari passu* with the increase of the precious metals, according to a most competent authority,* was in the following ratio:—

* Sir George Shuckburgh's Table. Philosophical Transactions for the year 1780.

In the year 1500 . . . 94 In the year 1800 . . . 562.

Or, which is the same thing, ninety-four pounds, shillings, or pence, in the year 1500, were equal to five hundred and sixty-two pounds, shillings, or pence, in 1800; that is, they would have purchased the same quantity of commodities. In the construction of his table, Sir George has taken the price of several articles besides corn, so that his comparative estimate may be considered as the nearest approximation to the truth.

The table, however, only comes down to 1800, which was an excessively dear year, so that we ought to make a deduction for the rise of prices in that year. From 1795 to 1801 wheat averaged 87s. per quarter; and butcher's meat had risen to 304s. 4d. per cwt., while in 1795 it was only 202s. 10d.* We will take, therefore, Sir George's estimate for 1780, as a fair average of the price of commodities, which will give the last member of the proportion as 427 instead of 562. We must also deduct the quantity of the precious metals from the aggregate of 1848, which have been imported since 1800, to enable us to arrive at the precise quantity at that period. The annual production of 1800, according to Humboldt,† was in round numbers 10,000,000 sterling; and the quantity in 1848, prior to the recent discoveries, was 18,000,000 sterling, and if we assume that 13,000,000 was the annual produce of the forty-eight years, which will be nearly the mark, seeing that Russia has only been a large producer during a third of that time, it will give a sum of 624 millions, which, deducted from 1750 millions, the aggregate produce of 1848, leaves 1126 millions.

The ratio of increase of the prices of commodities, as compared with the increase in the quantity of the precious metals will, therefore, stand as follows :—

Commodities.	Precious Metal.
As 94 . . . . 427.	40 . . . . 1,126.

While commodities have, therefore, advanced in price about 450 per cent., the precious metals have increased nearly 3000 per cent., or, in other terms, the precious metals are nearly seven times less valuable, in relation to commodities, than they

* History of Prices. Tooke vol. i., p. 62.

† Essai Politique, t. 2, p. 633.

were three hundred and fifty years ago. Here we have a clear proof of the decline in value of the precious metals, although gradual, and almost imperceptible, in relation to debtor and creditor.

The question now arises will the £20,000,000 of gold which threatens, the term permitted, to pour annually into the markets of the world, affect so great a disarrangement between debtor and creditor as many excellent people anticipate. Let us examine the question minutely. We have said 20,000,000, because that sum represents the average of the last two years, the flush, as it were, of the golden stream pouring in upon us. If this 20,000,000 continue to pour into the coffers of Europe it cannot fail to produce two effects—first, it will increase the aggregate of the coined monies circulating throughout Europe, and, secondly, it will alter the relative value between gold and silver. With respect to the latter effect, though it may not be so serious as anticipated, yet the consequences which flow from it will be of a most momentous character. Let us suppose, for instance, that gold, instead of bearing as it does now a relative value to that of silver, as 15½ to 1, should be only twelve times the value of silver. It would thus be depreciated about one-fifth, and the 113 grains of fine gold in our sovereign would be only worth *sixteen shillings*. In fact, it would require four shillings worth more of gold, at that price, or twenty-eight grains more, that is, 141 grains to discharge an obligation of one pound sterling. In all our existing contracts, the bond between the creditor and the debtor is, that for every pound sterling of obligation, the former shall demand, and the latter shall not be called upon to pay, more than 113 grains. The operation of such a change will not only affect the public creditor, but all those great social institutions, life assurance and reversionary companies. For instance, the former, at some distant date, in being called upon to satisfy a policy, after having taken, for a series of years, of the insurer, gold which was worth twenty shillings, would pay his representatives in gold, which would be only worth sixteeen shillings. And, on the contrary, a reversionary society which had advanced a sum of money in gold worth twenty shillings for the distant

reversion of a larger sum, would, when the reversion fell in, have to receive it in gold worth only sixteen shillings. In fact, all the calculations which these institutions have made during the last two generations would be stultified, to the immense gain of one class, and the immense loss of the other. In short, all creditors, annuitants, and those whose incomes are fixed in amount by any contract; all leaseholders, and those who are bound by time bargains, would find themselves great losers,—for it is hardly necessary to state that the depreciation would make itself felt by a general and permanent rise in the price of all articles, which is the same thing, only differently expressed, as a fall in the value of money. Some classes, however, would be able to meet the rise in prices, others not. Owners of unencumbered property, for instance, would not be greatly affected, as rent would rise to the amount of the depreciation, for the produce of the estate would exchange for more gold, and rent is only a portion of this produce agreed upon between landlord and tenant, so that the former would continue to receive the same proportion of the gross produce, which would amount to a larger sum reckoned in the depreciated gold. But a great portion of the property is encumbered, in some form or other, in this country, and the owners of such property will be benefited by the depreciation, as their rents will rise, and the sums which they have to pay to mortgagees, &c., will remain fixed.* The working classes, however, would be the most seriously affected by a depreciation, as their wages would remain nominally the same, or be a long time before they equalled the rise in the value of money. Such, in our opinion, cannot fail to be the effect of the anticipated depreciation, should it take place.

Let us now view the opposite side of the question, and examine the probabilities of the supply of £20,000,000 being continuous. In the first place, that amount of gold has not augmented annually the aggregate circulation, as it includes its own cost of production, which ought to be subtracted. Assuming 100,000 gold-finders in California, and 50,000 in Australia, the result of whose labours is measured by the aggregate

* *Vide* an able article in the *Times*, on this subject, of June 25th.

amount of gold collected, and allowing each individual forty shillings per week for sustenance, a low estimate, when viewed in relation to the character of the labourers, and the exciting nature of the labour—we shall then have an annual sum of £15,000,000 expended in actual necessaries. Deduct this sum from the twenty millions, which is the average produce of the gold-fields, and we have only *five millions* which it is possible to add to the circulating money of the world. Does it follow that this five millions will be so disposed of? By no means. The possessors of this surplus capital, looking at their characters, position, and prospects, and above all, at the animating impulse of the age, are far more likely to invest their surplus earnings in some industrial pursuit than put them out to interest (the only way in which such earnings could increase the aggregate circulation); to buy land, for example, or houses, or flocks, or in some way to sink their capital, with the view of increasing it, rather than revert to their old pursuits, and lend their money out to interest. In short, they are more likely to keep their earnings in the shape of capital than dispose of it so that it may be required for the purposes of money. Under the circumstances, then, even the five millions surplus would not be added to the money circulation of the world; nor, looking to the nature of things, which manifest themselves in so many ways, do we think they have been so disposed of.*

But we will assume that the five millions have been added to the circulating medium of the world. The question then arises, will it violently interfere with the standard of value? No—deferentially, no. The wants of the world will absorb it, and would absorb a much larger amount, were it likely to be obtained. Gold, in the shape of money, simply performs the duties of "petty cash," in every state in the world which is likely to be effected by its abundance. In all large mercantile transactions it is seldom used; being merely required to balance differences. Its peculiar and predominant function is in the ordinary disbursements of society, and especially for locomotive purposes; and as locomotion is an increasing quantity throughout the

* A well-written paper in the *Athenæum* of May 15 has satisfactorily explained in what way the additional gold has been disposed of.

world, gold, for that especial use, has been and will be, demanded proportionately. The world is now whisked about so rapidly by steam, either on ocean or on land—the order to "move on" is so imperatively given by the force of circumstances—that everything in connection with the immediate requirements of mankind partakes of its motion. Millions now travel, where, but a few years ago, hundreds scarcely ventured forth; and these millions require money, either in the shape of silver or gold, to facilitate their travelling. The railways alone will keep in almost constant activity the few millions of gold—say forty—that we have coined in this country. We might pursue this subject to a more demonstrative close, did space permit; this simple indication, however, must suffice to point out the new power of absorption which the world has acquired for the precious metals.

Again the manufacturers of this country and of Europe are increasing their demands for the precious metals. In one house alone, Messrs. Elkington and Mason of Birmingham, the consumption daily is three hundred ounces of silver and gold in proportion. *Ex uno disce*, both for England and France.

There is another view of the question, however, which ought not to be omitted. Will the present supplies of California and Australia be continuous? No, we repeat—deferentially, no. There is every presumption against their continuance. In the preceding pages of this book are described the several mines which have been discovered throughout the world, whether by excavating the rock, or by washing the alluvion of the watercourses, and which have uniformly presented the same features —first abundance, then barely remunerative supply, then scarcity, and, lastly, abandonment. These have been the almost universal stages of labour for the precious metals, from the silver mines of Spain and Laurion down to those of America —from the gold washings of the Pactolus to those of the Ural Mountains.* And such, in our humble opinion, will be the result of the Californian and Australian mines.

Viewing the question in this light, we may justifiably con-

* There would be little difficulty in proving, we apprehend, that the Russian mines barely pay for working at the present time, notwithstanding the annual

clude, first—that the supply of gold will not be so great as to cause any material alteration in its relative value to other commodities, or, in other terms, to disturb the general relation of things.

Secondly—that were the supply to continue at its present amount, the growing wants of mankind, either for locomotive, manufacturing, or for general social purposes, would fully meet it.

Thirdly—that the supply of gold has not hitherto been equal to the wants of mankind, even with the addition of the production of the Russian mines, which is proved by that metal gradually rising in value in relation to silver.

And, fourthly—that the discovery of gold in California and Australia, viewed simply in relation to social wants, may be considered as one of those opportune events which occur at long intervals, as though they were specially designed for the unravelment of human affairs, and for the onward movement of human progress.

production of three millions sterling of gold. A statement of the cost of working the Ural mines—of the kind of labour employed—of the interest of the state, apart from the economical bearings of the question—would furnish a curious chapter in political science. The work of M. Tchihatcheff, who visited the Siberian mines in 1842, suggests some curious reflections upon this head, and, did space permit, we could show that our conjectures, as regards the remuneration, are at least well founded, if not capable of precise demonstration.

THE END.