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"ROMANCE OF GOLD"

"They who worship gold in a world so corrupt as this have at least one thing to plead in defence of their idolatry - the power of their idol. This idol can boast of two pecularities; it is worshipped in all climates, without a single temple and by all classes without a single hypocrite."

G.C. Colton

Although gold is the first metal mentioned in the bible - in the second book of Genesis - it is to Egypt that one refers for the earliest known references. Some 5 000 years before the Christian era, and before the first Pharaohs, Egyptians living along the Nile were covering the handles of stone cutters or flint knives with gold. The gold had no doubt been recovered from the Nile, probably as small flakes which had glittered, or should I say, 'glistered', amongst the sand particles and which had been painstakingly collected. Being flakes, there is no doubt that this gold, as the Roman writer Pliny has reported, was purer and finer than the larger pieces or nuggets to be found higher up the river, since in the course of time, the very slightly acid waters of the Nile would have dissolved out the silver and most of the minor impurities such as copper, but the noble metal, gold, would remain untouched. This purer gold was softer and more easily worked than that in the nuggets or vein deposits.

By the time/....

By the time of the first Pharaohs, at the beginning of the fourth millennium B.C., the inhabitants of Abydos in upper Egypt were already fashioning bracelets out of gold and chiselling or tooling designs on the surface. Gold production from these early days was under control of the pharaohs; there is evidence of the appointments of 'inspectors of gold' and in 3150 B.C. one of the first dynasty pharaohs, Menes, set a legal value on gold which was made into little 14 gram bars marked with his name. Trade with Asia was increasing and this brought silver to Egypt. Prior to this trade, silver was rare in Egypt, and, on a weight for weight basis, was worth more than gold! With the influx of silver, Menes fixed the gold silver ratio as 1 : 2,5 - i.e. gold was worth two and a half times silver.

In Egypt, gold was worked before copper, bronze or iron, since it could be worked cold. Fire was known before this time, but only later was it realised that gold could be melted. This probably followed the discovery that certain rocks such as the brightly coloured malachites and azurites could be melted, or rather smelted, to produce copper. The iron age was to follow.

The early Egyptians followed the alluvial gold upstream, finding richer deposits as they approached the land of Nubia (Egyptian 'nub' = gold). This led them to discover the origin of the gold in the vein deposits on the quartz plateau extending from the Nile at Thebes to the shores of the Red Sea in the east. A second area was found further south, at the Fourth Cataract, also stretching to the Red Sea. Thus Egypt was rich in gold and she set about exploiting it to the full.

It is known/.....

It is known that during the fourth millennium B.C., the Egyptians used blow pipes to raise the temperatures of their furnaces to over the 1063°C necessary to melt gold. They had to use chaff or straw as a fuel since charcoal was not available in a treeless land.

An official document, about 2500 B.C. describes how gold was escorted from the mines near Kosseir to the Nile at Coptos. The famous Turin papyrus found at Thebes, depicts the surface layout of a mine, and this is now taken to be the Dereheib mine, situated in the Kosseir district. The map is believed to have been prepared about 1300 B.C. and is therefore the oldest mining map in existence. Work started on this mine under Pharaoh Sethos I, and was continued by his son Rameses II - the Great. The Pharaoh's palace (was he the mine manager?) is the large central domain, and the rather diminutive cottages, a slight distance away, are the workers' (slaves) accommodation. This map is interesting, too, in that an attempt has been made to depict mountains, though not in the contour form of today.

Diodorus, a Roman writing in the first century B.C. has left us a very full account of the way mining was carried out under the Ptolemies in the second century B.C.

> 'Gold is got together with much suffering and expense ..... the kings of Egypt collect together and consign to the gold mines those who have been condemmed for crimes and also have been made captive in war .....

sometimes/.....

sometimes only themselves, but sometimes likewise, their kindred ..... they toil at their tasks both by day and all night long ..... the hardest of the earth which contains the gold they burn with a good deal of fire and make soft ..... a man who is expert in distinguishing the stone supervises the whole process ..... the women and older men (grind) the stone until it is as fine as wheat flour ..... they rub the pulverized quartz on a broad board which is slightly tilted and pour water on it. The earthy part flows down ..... but the gold clings to the board because of its weight.'

The purity, or as we say, the fineness of the gold in the objects left behind by these workers was mostly around eighty to eighty-five per cent gold and only occasionally did it exceed 90 per cent. From this it is concluded that the early goldsmiths only learned, towards the end of the second millennium B.C., the art of separating the silver which is the main impurity. This was done, according to Diodorus, by mixing the impure gold with lead and salt and heating the mixture in an earthenware pot in a furnace, known nowadays as cupellation.

Not satisfied with their own mines, the Egyptians began to look further afield, as is to be seen in the exciting hieroglyphic of one of Queen Hatshepsut's ships loading in the land of Punt for the return voyage to Egypt in 1500 B.C. Three hundred years later, Rameses the Great, sent,

in search/.....

in search of gold, a powerful fleet carrying merchants, mineralogists and prospectors, in all, it is recorded, 10 000 men. King Solomon of Jerusalem and King Hiram of Tyre are reported to have despatched sailors and slaves to the land of Ophir. These voyages took three years and they returned with twenty or more tons of gold per trip, plus 'silver, ivory, monkeys and apes'.

Where was the land of Punt or of Ophir? Since ivory and lion skins were also brought back, historians have suggested the lower half of Africa; but the theory that the gold came from as far away as Monomotapa (Rhodesia) or Zimbabwe has no modern archaeological support. All that can be said is that from the earliest of days, a major gold trade existed down the east coast of Africa.

Up to the start of the Roman era, 50 B.C., it has been estimated, by Heinrich Quiring, that Egypt, Nubia and Ethiopia produced some 3 500 tons of gold. Another 400 tons came from the rest of Africa.

In Thebian Egypt, gold was closely tied to religion. Their highest god was Ra, the sun god, born each morning; he rose as a calf in the east, becoming a powerful bull by midday, whose body gradually turned into gold as he died in the setting sun.

If their gods were of gold, so too then must their earthly images and idols be of gold. Their pharaohs, believed to be descendants of the gods, must too be provided with gold, to ensure their divine after life. Had not the goddess Isis declared unto the pharaohs - 'I give

you this land of gold; I give you the mines with all that you can find therein'.? And was it not Isis, the mother of Horus, who bribed the guard with a gold ring and thus obtained entry to the secret island where Ra, the all powerful and most perfect, had retired to rest? Gold, they believed, like Ra, was incorruptible - but gold could be used to corrupt!

The treasures of Tutankhamen's tomb found undisturbed by Howard Carter in 1922, are illustrative of the quantities of gold that were collected in Egypt in the fourteenth century B.C. and of the abilities of the craftsmen of the day. In the coffin itself, there were 112 kilograms of gold. There was also a golden throne, a gold covered ceremonial stick and a dagger with its sheath practically all gold. The backdrop of the throne, 20 inches square, was made of a thin sheet of gold, and on it is worked, in a most delicate and delightful manner, a representation of the young king being anointed by the queen, his wife. The craftsmanship of these works is superb, the gold being delicately chased with wonderful refinement, colour is added by inlaying tinted glass, and, on the dagger, bands of enamel or cloisonné work add to the richness and variety of the design. The goldsmiths and jewellers must have laboured with great patience and dedication to the craft. One can only assume that once one pharaoh died, they immediately started working preparing the funeral furnishings for his successor. It is tragic that later tombs have been pillaged and thus so few records kept for posterity. Surely their riches would have been even more magnificent than those of this youthful king of 20 years who can only have

reigned/.....

reigned for a decade.

Though one may enthuse over the burial bounties of the Egyptian pharaohs, one must not forget the great artistry, at this early period, of the Sumerians. These people living in the valley of the Euphrates, had apparently no local sources of gold, and yet, from about 2800 B.C., they have left behind, in their burial places, some of the most exquisite examples of gold work.

Queen Shub-Ad, more correctly Pu-abi, according to the custom of the time, was buried with all her immediate retinue, her servants, her musicians, her grooms, her chariot and her personal possessions. In the damp sands of the burial grounds, only the gold objects have remained to tell us of her life and times. Her wonderful headdress, obviously designed to be worn over a wig, consisted of wreaths of beautifully designed beech leaves, each delicately traced with the little veins, surmounted by flowers made of gold and semi-precious stones. Low over her forehead came a diadem of solid plain gold ringlets. This rather elaborate headdress contrasts strongly against her simple plain oval gold bowl and her delicately incised gold beaker.

A more impressive example of the art of these people is Mes-kalam-dug's helmet, retrieved from a nearby grave. He must have been a nobleman or a prince. The helmet is exquisitely fashioned in 15 carat gold in the form of a wig, bound round with a diadem. The main locks of hair are hammered up in repoussé, i.e. the design is beaten out from the back,

or reverse/....

or reverse side of the metal. Each hair line was then incised on the shaped helmet. It is an example of extremely skilful work, as the craftsman must have been well trained in the art of beating and shaping the gold with intermittent annealing to soften the metal and return the elasticity which is lost during the beating process. These people, too, had apparently discovered the lost wax (cire perdue) process for casting gold. A clay model is prepared, covered with wax to the desired thickness, then the design or pattern incised in the wax, which is now covered with more clay. The whole is now baked, the wax melts, to leave a mould into which the molten gold can be poured. It would appear that the Egyptians only discovered this technique about 2000 B.C. - 800 years later.

Both the Egyptians and Sumerians knew the technique of brazing whereby gold pieces could be joined together using a copper gold alloy with a melting point lower than gold; but it was the Sumerians who developed the more advanced bonding technique used in granulation. In this technique, gold beads, wire or filigree were glued into position with a copper compound such as a carbonate or hydroxide. The assembly is then placed in a charcoal furnace or heated with a blowpipe. As the temperature rises, the hydroxide, at 100°C is converted to oxide, and at 600°C, the glue is carbonised. At 850°C, this carbon reduces the oxide to metal which at 900°C alloys with the gold surfaces to give a bonded joint. This permitted a high degree of sophistication in design.

In later years, this technique was brought to perfection by the Etruscans - a tribe believed to have been Phoenician pirates who, in 900 B.C., settled in Italy between present day Rome and Florence. The breadth of interests of these hardworking and highly

cultured/.....

cultured people is best described by Aristotle who said 'they fought their battles, kneaded their dough and beat their slaves to the sounds of the flute'.

The Sumarians, or people of Ur, living in the land associated, in Biblical times, with the Garden of Eden and the Great Flood, were apparently a small peaceful and agricultural nation. How did they learn their skills and where did they get this gold? They may have been sailors, they lived on a major river and were proud of their ships. Models of these vessels, in gold, have been found in some graves. Did their gold come from Egypt? There seems little doubt that their skills were quickly spread along the trade routes to Phoenicia, on the Mediterranean coast, and then on to Crete and Greece.

Archaeologists, particularly Sir Arthur Evans, excavating at Knossos in Crete, have proved that this island, which has little or no natural gold, started to work gold in the early Minoan period, about 3000 B.C. By the year 2000 B.C., Cretan goldsmiths were beating gold into delicate tracery and reproducing delightful designs of flowers and leaves. The art of repousse was known and they could also make attractive use of inlaid semi-precious stones.

As an island people, the Cretans were sailors and initially, no doubt, got their gold and much of their expertise from Egypt, but by the year 2000 B.C., they were travelling further afield, encouraging others to search for and recover gold. As their gold store increased, so their skills in jewellery improved. From flowers and foliage they turned to depicting animals, particularly the Cretan bull. Their designs became more complicated, both artistically and technically. They used various alloys with different colours for inlays, and for greater contrast, they used silver and black niello, (powdered silver, lead, sulphur and

copper)/.....

copper). Crete became known as the home of the wizard "fingermen" whose skills in metallurgy were legendary and whose praises were sung by Homer. Describing the design of a shield, he says : "a vineyard teeming plenteously with clusters, well wrought in gold, black were the grapes, hung all on silver poles. Round it ran a ditch of blue cyanus and around that, a fence of tin .....".

Cretan jewellery spread to Troy. This was proved by Schliemann, a German who had made a fortune as a banker in the Californian gold rush, and who then turned to archaeology. He found a wealth of gold diadems, rings, bracelets and brooches when excavating what is called today the second city of Troy, which thrived just after 2000 B.C.

Crete was over-run in 1375 B.C. and the palace of Knossos was sacked; but by this time, their skills had spread to Greece, to the Peloponnese. The Archaean princes were buried, as many South African travellers know, near Argos, south of Corinth in rough stone tombs covered with earth mounds and these have yielded a wealth of gold treasures. These Mycenaean relics consist mostly of gold collars and clasps which adorned their rich cloaks, of highly decorated bowls and cups, all slightly reminiscent of Crete. Most spectacular of all though are the gold death masks - delightfully patterned with the eyes half closed and the mouth slightly scornful. These date from 1600 B.C. There seems some relation between these burial graves and that of Bush Barrow

in the south/.....

in the south of Britain, and at Rillaton in Cornwall, in a similar burial mound, a golden goblet dated about 1500 B.C. has been found. This is beaten from a single piece of gold and is distinctly of Mycenaean character.

Irish gold dating from 2000 B.C. is simple in design, yet beautifully executed. It was widely exported and possibly here too there was an interchange with Crete. More and more gold was being used for every day wear, for gold necklaces, clasps and brooches, for cups and bowls and the household utensils of kings and princes.

There was a growing trade in gold, for its own use or as a means of exchange. Gold was in wider circulation and had been accepted as an international means of exchange. It had long been recognised in Egypt as a measure of value, though only for major transactions. For the minor day to day operations, little weights of granite or bronze, often with a geometric pattern, were used.

Gold rings are known to have been used as money in Egypt since before 2000 B.C., and an attempt had been made to standardize them at 7,5 grams each. Rings were used for currency in Ireland in 1600 B.C., and from here the custom spread to Britain. Silver and electrum from Asia also came into circulation. As the quantity of gold in Egypt increased, so the pharaohs relaxed their royal prerogative and more gold went into the hands of the citizen, though even as late as 1300 B.C., Sethos I refused to pay his miners in gold. 'As for gold' he said, 'it is not for your needs'.

By the year/.....

By the year 2000 B.C., the Cretans were stamping little lumps of gold for currency purposes; and in 670 B.C., it is now believed, King Gyges of Lydia, a small state in what is now Turkey, issued the first gold coins. These were oval and contained 14,5 grams of electrum. Electrum, (73 per cent gold and 27 per cent silver) was the natural alloy of gold found in abundance in the river Pactolus, a river flowing in the neighbouring state of Phrygia. Electrum has a colour yellower than pure gold, and its name stems from the Latin name given to yellow amber - 'electron'.

These early coins, in later years, were known as little rainbow dishes (regenbogenshüsselchen) due to a belief that they were to be found where the rainbow touched the earth! The probable explanation of this belief is that they were found washed out of the earth after heavy rain!

Like the legend of the golden fleece which Jason had had to collect to regain his kingdom, there are similar stories concerning the two little states of Lydia and Phrygia. Midas was the king of Phrygia and according to legend, he had fêted the god Dionysos. In recompense, he was promised his first wish. 'I wish', said Midas, 'that everything I touch will turn to gold'. The wish being granted, he immediately wished himself riches. He was able to send a golden chain of incalcuable value to the oracle at Delphi, and

thereby/.....

thereby protect his future with the gods. But alas, everything he touched, turned to gold. The food he wished to eat, turned to gold as he raised it in his fingers to his lips. Disillusioned, he implored Dionysos to withdraw this magic power. Dionysos told him to bathe in the river Pactolus, which Midas did and so lost his golden touch, but from then on, the river Pactolus was ever a source of gold, to be collected from the river bed by the Phrygians. Unfortunately, neither the Romans nor more modern prospectors have succeeded in finding such riches in any rivers in this area.

An equally romantic legend describes the rise to power of Gyges in Lydia. Gyges was a poor shepherd, who, entering a cave one day saw a bronze horse with a portal in its side. Looking through the portal, he saw inside the body of a man on whose finger glistened a gold ring. He seized the ring and placing it on his finger, he found he could, when he wished, by turning the ring, make himself invisible. With this great power, he amassed a fortune and the throne of Lydia. Not only is he given the credit for introducing the first gold coin to the world, but he is also said to have invented the game of dice!

Four generations later, one of his descendants, the rich Croesus, on inheriting the throne introduced a pure gold coin and thus removed some of the suspicions which surrounded a coin made from an alloy. This coin weighed 11 grams and was 98 per cent gold, which was as pure as they could make gold in those days. It was embellished

with the/.....

with the royal emblems, a lion and a bull, and, curiously, named 'slater', meaning, 'I am fixed'. Croesus somehow continued to augment his gold revenues, and like his predecessor, he paid homage to the shrine of Apollo at Delphi, where according to Herodotus, his gifts of gold alone totalled 4 tons of bullion and included 'his wife's necklaces and girdles'. His generosity seems to have been misplaced, because in asking for advice before tackling the Persians, the oracle replied 'a great King will be overthrown'. It did not occur to Croesus that he might be that king.

It was the Lydians who discovered the 'touchstone' a black jasper stone, and by rubbing, or scratching gold against the jasper, one could tell by the colour of the streak, the fineness of the gold. Other tests used in those early days were, of course, density, and the melting point.

In addition to the gold stater, Croesus introduced a silver coin of similar design. In purchasing power, one gold coin was worth 10 silver coins, though at this time, on a weight for weight basis, gold was worth 13 times as much. The bimetallic system of coinage was thus devised, but the king apparently exercised strict control over all mining and washing, thus regulating the ratio.

Croesus was to be defeated by Cyrus the Great of Persia in 546 B.C. The Persians pushed further west and over-ran Egypt, thus gaining control of the large quantities of gold of Lydia and Egypt. Darius, Cyrus' SUCCESSOR [redacted], started paying his armies in gold darics - a conqueror's coin depicting a kneeling archer - and this was much preferred to the silver coins with which the Greeks were paying their soldiers and mercenaries. Philip of Macedon realising that wars are won with gold, opened up the Thracian mines. His armies flourished, he became King of Greece and prepared the way for his son

Alexander/.....

Alexander the Great, to extend the Greek conquests from the Mediterranean, through Egypt and through Asia to as far afield as India. Conquests brought more gold and the practise of coining gold expanded.

The designs on many of the Greek coins are known for both their elegance and neatness. In Egypt, after Alexander's death, one of his generals, Ptolemy became king. He was the first king to place his likeness rather than that of the gods, upon a coin. His son Ptolemy II pictured both himself and his wife, and on the reverse, his deified parents. In both cases the wives were also the sisters of their husbands - a recognised Egyptian custom.

The Romans were rather slower in introducing gold coinage. Initially they were short of metal, but Caesar in 46 B.C., after defeating the Gauls, introduced the aureus, a beautiful gold coin, 97 per cent fine, weighing 8,18 grams and minted from the booty he had collected. Each of his soldiers, on this occasion, was rewarded with 200 aureii. Alas, successive emperors found it difficult to maintain this wage and the size of the coin got smaller and smaller. Soon it was only used to pay foreign soldiers, and finally its use had to be restricted to the purchase of vital imports. About 300 A.D., Rome had to forbid the export of gold. It had closed the gold window! Earlier Pliny had noted with bitterness 'Our gold flows far away from us!', and at the rate of 2 tons per year! Originally Rome had no gold, then it became rich through conquests, but spent it extravagantly to buy luxuries - furs and amber from the north, spices, silks and porcelain from the east. Rome ruined herself for luxury. The East, and India, in particular, was starting to earn the reputation as the 'tomb for precious metals' - 'the sink of gold and silver'!

The monetary/.....

The monetary problems during the decline of the Roman emperor makes interesting reading. Caesar's and Augustus' gold coinage was undisturbed for 75 years, but with Nero (A.D. 54), deterioration started. The gold coins got still smaller, and eventually gold, likewise silver and even bronze, went out of circulation. Aurelian in A.D. 274 tried a 'managed currency', but the population rose in revolt, and 7000 soldiers died in quelling the rebellion. In A.D. 301, Diocletian issued his price fixing decree - it too failed and was abandoned within 5 years. Soon in the western empire, there was no money, no weights and measures, no controls, trade was by barter and the only law was the sword!

But Diocletian did succeed in paving the way for Constantine to start the eastern half of the empire at Byzantium (Constantinople) in 325 A.D. With it Constantine reformed the coinage and introduced the 'solidus' weighing approximately 65 grains or 4,4 grams. It was accepted by the Greek traders, who wanted sound money, and as trade increased, so did the gold supply - there was enough to back the 'solidus' (the 'firm' or 'fixed' coin) and for 800 years this coin maintained its standard. Known as the 'Bezant', it circulated from Ceylon to the Baltic.

Elgin Groseclose summarises the position:

> "The Byzantine Empire is an example of sound commercialism and testimony that money, if handled properly and with due restraint, can be made to serve the highest purposes of man. In its commercial

institutions/.....

> institutions and commercial philosophy lay a great part of the secret of its long continued vitality. And a principal feature of that commercial philosophy was the tradition of sanctity of the coinage - the idea that it is the duty of the state to avoid tampering with the money mechanism for personal or political objects, and that the duty of commercialists is to use money with restraint, as a means and not as an end."

India's own gold production has been very limited, and through the years she has painstakingly tried to work low grade occurrences with 'monumental patience', particularly in the Southern Deccan. Herodotus the Greek historian (484 B.C. - 428 B.C.) gives us an interesting account of a source of gold in the parched sandy desert of Northern India, where there lived a breed of gold digging ants who were the size of foxes. In the sand piles in front of their burrows were large amounts of gold, and the Indians, using great stealth and sublety, collected this gold, escaping from the fierce foxes by using fast camels! The story may be apochryphal but prospectors and water diviners still study the activities of ants since the spoil from their workings provides a record of the sub-soil. In Rhodesia, it has recently been said that ant workings have been noted to depths of 200 feet below surface. Ants need moisture and a line of ant heaps can often point to a water barrier or dyke and thus to a favourable site for a water borehole!

As a slight diversion, archaeologists, according to Professor Revil Mason, examine ant mounds to

determine/.....

determine what lies beneath the surface, and contrariwise, ants are known to take coal, pollen and seeds down into their burrows, to confuse the archaeologists!

With the advent of European soldiers and explorers to India, in the early 19th century, scattered ancient workings were discovered. Modern mines have been established at Kolar and at Hutti. The Kolar mines are characterised by their very difficult ventilation and rock mechanics problems. At Hutti, ancient workings dating, possibly to the Roman era, have been found and examined. Fire setting was used, and the ancients succeeded in mining down to 620 feet below surface.

Roger Summers has suggested that the Indians, disheartened by the paucity of gold in their country, moved to Africa in search of better ore, and that they were the first to organise gold mining in Monomotapa, Rhodesia.

Gold was in short supply in the western world after the collapse of the Roman Empire. The mines in Spain and Europe petered out either from lack of resources or lack of management. Much of the gold passed out of coinage and though often referred to as a major measure of value, it was seldom seen. Silver, bronze and copper were more common. Europe had lost her gold to the east and to the Arabs.

Silver, tin and copper were used for coinage in China, but with greater sophistication. The Emperor Wou-ti had introduced fiat money made from a silver-tin alloy in 140 B.C. It was the shape of the coins and not the size that gave them their different values of from 300 to 3000 copper pieces. Copper was the basic currency.

Two centuries/.....

Two centuries later, China was making paper from silk waste and bamboo fibre, and by 650 A.D., having mastered the problems of indelible ink and printing, the T'ang emperors issued 'bills of value' each worth 100 copper pieces and costing considerably less to make than the silver coins. Paper currency had arrived! Marco Polo in 1275 expressed his surprise that the Chinese 'used paper as if it were gold'.

Meanwhile, the cowry shell was preferred in the more primitive parts of Africa. Bars of salt were currency in Ethiopia. Gold and gold dust served the purpose in Sudan and across Africa to Senegal. Arab money in gold, silver and bronze ruled the Red Sea and along the caravan routes. In search of more gold, the Arabs in 850 A.D., re-opened the mines of Nubia and Ethiopia. Disenchanted, they pushed west to the present state of Mali, to Timbuktu, reported to be the city of gold, and then further west, towards the coast, in search of the negro chief Kaya Maghan Cisse, known as the 'King of Gold' who wore a crown of gold ornaments around his head and 'whose dogs carried tinkling gold bells'. Gold is still worn as ornaments in West Africa, particularly by the women of Mali. The Portuguese, too, as the Carthaginians had done earlier, came down to the West Coast of Africa, trading cloth and merchandise for gold.

European trade began to flourish in the Mediterranean once the Crusaders began to push back the Arabs. Gold florins were minted in Florence in 1252, and later in England. Doubloons (Doblos del oro) appeared in Portugal and

Spain/.....

Spain and ducats in Venice.

Again there is a resurgence of faith in gold, a recognition of its worth, be it for war (pecunia nervus belli - money is the sinews of war) or for state administration. Kings searched for alchemists to change impure metals into gold 'by philosophic art'. Explorers were despatched to find it - 'Get gold' wrote King Ferdinand to his men in 1511. 'Humanely if you can, but at all hazards, get gold'.

But gold was not easy to find and the history of the period is one of avarice, of coin debasement and monetary malpractice. There were also problems of bimetallism; what should be the ratio of gold to silver? If countries had different ratios, astute operators could play one against the other. When the Italian gold florin was struck, the ratio was 1 : 13,6, but silver was worth more in France, and so it disappeared from Italy. Italy had to re-adjust its ratio to attract its silver back and for most of the 15th century, its ratio stood nearer to 1 : 9,25.

In most countries, silver was the most common form of currency, gold only being used for the biggest of transactions. In Britain, the pound sterling derives its name from the French livre, which was the value given to a pound of silver. Conversion to gold was not fixed, since the gold silver ratio was 1 : 11 at the beginning of the 16th century, changing gradually to 1 : 16 by the 18th century.

England soon/.....

England soon recognised the greater importance of gold, and in 1663, Charles II passed an edict allowing free export of gold and silver. We are told he did this as a favour to his mistress, Barbara de Villiers, and she in turn had been won over by the East India Company (of London) who wished to further their trade in India and the east, using gold. At the same time, Charles II introduced a new gold coin called the guinea, since the gold came via the Portuguese from West Africa. Curiously, no attempt was made to give this coin a fixed value as against silver; it was allowed to float in terms of the silver coins. In 1666, Charles II allowed free minting of metals. This meant anyone taking a bar of gold or silver to the mint could have it turned into the standard gold or silver coins at no cost.

But the silver coins, being in more general use, wore thin and, being clipped, became smaller. More and more were demanded in exchange for the gold guinea. In 1695, the government, by decree, pulled the rate back from 30 shillings in silver coins to the guinea to 22 shillings. Finally, in 1717, Sir Isaac Newton, settled the rate at 21 shillings. By now, the silver coin was worth somewhat more as a coin than as metal and there was little likelihood of the coin being melted for its silver content. England was virtually on the gold standard, though finality was not reached until 1798 when she abolished the right of free coinage of silver. In 1816, the guinea of 21 shillings was surplanted by the gold sovereign, worth 20 shillings, and the metallic value of the silver coins was brought further below their

legal/.....

legal tender value.

The sovereign, the forerunner of our R2 piece, weighs 7,98 grams and at 22 carat (916 fine) contains 7,32 grams pure gold.

In 1913, the sovereign had the same value it had in 1816; though there had been occasions when the Bank Act had had to be suspended for temporary periods. This was again necessary in 1914 during World War I when Britain needed all her gold for her war effort. In 1925, Britain attempted to return to her old standard, but the consequences were disastrous. Nevertheless, since the time when Charles II introduced the guinea in 1663, Britain had prospered on her gold standard. It was a mark of respectability and probity, her pounds were accepted throughout the world, and her trade and overseas colonisation increased immensely. Other western countries, too, though in lesser fashion, prospered. During these years there had been a steady influx of new gold.

First there was the Spanish American gold, initially from Mexico, and then in far greater abundance from Colombia and Ecuador. By the 18th century, it was Brazil that was the major producer. In the 19th century, there were major gold rushes in the United States, in Australia, Canada and in South Africa. Gold which had been in short supply since the Roman era, was being found in growing quantities as the following figures indicate:-

Sheet 24/....

WORLD GOLD PRODUCTION
(after Heinrich Quiring)

Period	Metric tons
3900 B.C. to 500 A.D.	10 257
500 A.D. to 1492 A.D.	2 472
1492 A.D. to 1800 A.D.	4 166
1801 A.D. to 1900 A.D.	12 303

There is little doubt that the growing flow of new gold to Europe and to the western nations contributed largely to the success of the gold standard system and England with her maritime prowess and trading strength profited immensely.

The conquest and pillage of Mexico and the states to the south by the conquistadores is, to us, today, a story of extraordinary contradiction. The passionate desires that these people had to spread their Christian faith were equally matched with their unholy greed for gold. It was gold, for themselves, for their king, and for their church which spurred them on through their countless hardships and vicissitudes.

Cortez, on arrival in Mexico in 1518 first established his 'City of Riches of the True Cross' - 'Villa Rica de Vera Cruz' and then proceeded with the cruellest efficiency to ransack the temples of the Aztecs and melt their golden treasures for transfer to Spain. The Aztecs were dumbfounded. How could these strangers destroy their elaborate ornaments and statues? Gold was to be treasured

for the/.....

for the things of beauty that are made from it! The Aztecs were proud of their abilities to fashion gold, they knew how to cast gold; they could use the lost wax process to make the most intricate designs; they could inlay precious stones, and they could make alloys with silver to get different shades of colour. They were, though, ignorant of enamelling.

Pizarro, going further south to Colombia, Ecuador and Peru, found even larger quantities of gold, and, though he did not appreciate it, still higher standards of workmanship.

These people had worked gold for 2500 years, they could alloy it with copper to get red tints; they could make low grade alloys look like fine gold and they had learnt the technique of gilding. In Ecuador, they made the first white gold - 15-35 per cent gold, 55-75 per cent platinum - an extremely difficult task, since platinum has a high melting point 1755°C in comparison to gold, 1063°C. They mixed fine grains of platinum with gold dust and alternately heated the mixture with a blowpipe on a piece of charcoal and hammered it until they got a homogeneous mass. The principle of this process, known as incipient fusion or sintering, was forgotten after the conquest and was independently re-invented only during the 19th century. This is the basis of modern powder metallurgy. But Pizarro had no respect for such skills. Capturing the Inca chief Atahualpa, he offered him his freedom if he could first fill his prison room with gold. This Atahualpa arranged, but the bargain was not honoured. The Inca chief was cruelly killed, though first the poor victim had to be baptised into the Christian faith!

Gold and silver/.....

Gold and silver were not regarded as wealth by these primitive people; they had no use for money in their communal tribal system, since all property was shared. Like the Egyptians, they connected gold with the sun. The Incas spoke thus of the origin of life on earth, three eggs fell from heaven - one of gold, one of silver and one of copper. From the gold egg came forth the nobles, from the silver, the princesses and from the copper, the common people. Gold was thus the symbol of pre-eminence and superiority as ordained by celestial will! Hence too, the legend of El Dorado. The Chibcha Indians, on the Bogota plateau in Colombia were said to anoint annually their young chief with balsam and roll him in gold dust. This he ceremoniously removed by bathing, in full sun, in the waters of Lake Guatavita, whilst his followers threw gold and emeralds into the lake as a sacrifice. Neither the conquistadores, nor Raleigh who searched for it in 1595, succeeded in finding this lake; modern skin divers are still searching! But the sad tragedy is that practically all these beautiful South American gold jewels were destroyed, melted down to send as bullion to Europe.

But out of the profusion of gold that was to flow to Europe, there arose a resurgence in the art of jewellery. Princes and kings realised that their stature depended on gold. They had to show it off on every possible occasion and even went into battle displaying their magnificence. When the Duke of Burgundy, Charles the Bold - was defeated in battle by the Swiss in 1476, his collection of jewellery

renowned/.....

renowned for its originality and delicacy, and the envy of many a lesser court, was divided amongst the victors, many of the more famous pieces being taken apart for distribution.

The famous banking house of the Fuggers in Augsburg was rising to prominence in these years. Several of Charles' jewels found their way to this trading house, which was becoming one of the largest gold trading houses in Europe. It established an intricate system of watching for the next shipment of gold from the Americas, and arranged the distribution. By the year 1500, they themselves had accumulated 100 000 gold florins. By 1597, we are told, their wealth had reached 5 million florins.

This was the beginning of the renaissance period and the church and nobility rivalled each other in sponsoring the arts, and naturally, gold jewellery was in great demand. Possibly the best story of this time is that concerning the Saxon Elector, Frederick Augustus I, or Augustus the Strong. He held his court in Dresden, and spent vast sums on precious stones obtained from the local Erzgebirge mountain mines. He was a great patron of the arts; he had his own court jewellers, the Dinglingers, and also had the most amazing collection of gold snuff boxes set with semi-precious stones, but, and I quote Graham Hughes:

> "with extraordinary enlightenment he realised that his prosperity depended on the miners in these nearby mountain ranges and treated them as minor aristocrats, giving them technical schools, a frock coated uniform, which is still worn today

in the /.....

in the mining region of Clausthal - Zellerfeld and sophisticated tools which rivalled the English pioneering in the Cornish tin mines. Throughout history miners had been slaves and prisoners of war, beaten with the whip right from ancient Egypt to Mount Potosi in Spanish colonial South America, from ancient Greece to Louis XIV's France. Augustus .. knew that mine workers, though their job might be the toughest in the country, were fundamental to it and nurtured them accordingly!"

Benvenuto Cellini, probably the greatest of all goldsmiths, learnt his trade working for the Medici family in the early sixteenth century. His most famous piece is the gold salt cellar made for Francois I of France, who, said Cellini, cried out with astonishment when he saw it. It depicts Neptune and Diana, superbly modelled in gold, seated on the edge of a bowl surrounded by minor reclining figures also in gold, delicately highlighted by the blue of the base.

Goldsmiths, too, rose from being humble artisans to becoming people of substance. They were asked to store gold by their customers, then they started lending gold, for a fee, of course. They had, in fact, become bankers. Now, of course, the street where they lived in London, Lombard Street, is the most coveted address for any bank!

The start of the eighteenth century is remembered for the rise and fall in Paris of John Law. This Scot, son, I will have you know, of a goldsmith, persuaded the

French/.....

French citizens to place all their gold savings in his bank, and in return, issued paper money. He went further, he issued shares in a company formed to develop the Mississippi. At the beginning, all made fortunes, but mostly in paper! People came to Paris, bought shares and within hours, prices had risen and profits were there to be counted. Some took their profits and invested elsewhere, all prices rose, more money was made. All shares rose, houses, farms and chateaux trebled in price. It was a glorious inflation, for those on the right side. Then someone realised that there was little backing to these pieces of paper and started trying to change them back for gold. At first, Law's bank paid out, next, it paid out at a reduced rate, then the rush started and the country's whole economy collapsed.

Once again a gold window had to be closed, but by this time, several astute citizens had not only taken their profit in gold, but they had hidden their gold, buried it, or better still, taken it out of the country. Just in time, too, because the French government promptly prohibited the hoarding of gold and silver, and later, forbade their use for the payment of any debt. The central bank had to get the gold back to start all over again and to build up a gold reserve against which paper money could be issued.

Seventy years later, in 1793, at the time of the French revolution, the new regime introduced the 'assignat' saying it was superior to gold or silver. The

citizens/....

citizens resisted, and once again threats were applied; it was six years in chains for anybody using gold or silver for money transactions, the guillotine for anyone who refused to accept an assignat and confiscation of all gold and silver found hoarded. Despite these drastic penalties, the French citizens continued to take the risk and hid their gold.

The fundamentals of monetary mechanisms were debated by the Greeks, by Aristophanes and Aristotle. Money must possess intrinsic worth. Copernicus in 1526 complained that a new bad money depreciates and drives away good money, and finally Thomas Gresham in 1558, in his advice to his queen, put it succinctly - 'Bad money chases good money out of circulation!' Or, if you like, paper money chases gold into hiding!

By the nineteenth century, America was developing and expanding. The colonists had reached the west coast and on the 2nd February, 1848, after a minor war, the United States signed a treaty purchasing the state of California from the Mexicans for $15 million. But, only ten days earlier, on the 24th January, gold had been found by Marshall at Sutters Mill! California, at this time, was little but a desert, with a few farmers and Jesuit and Franciscan friars. In 1840, its total population was estimated at 15 000 souls. By May, 1849, the little local paper in San Francisco reported that as all their readers and advertisers had left town for the gold fields, that they too, must close their doors! The gold rush was on. Sailors left their ships, soldiers left

their/.....

their regiments and everyone rushed for the gold fields.

Such riches had not been found before. By 1851, 80 tons were being produced per year, and by 1856, California had produced more gold than Spain had mined in 500 years in Roman times, or more than Brazil had produced during its heyday in the eighteenth century.

The entrance to the famous San Francisco harbour was christened the Golden Gate, the entrance to the land of gold.

The scene now moves to Australia. Edward H. Hargreaves was born in England and emigrated to Australia at the age of 14. In 1848, he had joined the gold rush to California, but after two years decided he would go back to Australia and find gold there. Arrogantly, on the ship, he prophesied that he would find gold within a week of his arrival. This he did on the 12th February, 1851 at Guyong near Bathurst, New South Wales - and this is how he recorded it:

> "'Here it is', I exclaimed and then washed five panfuls in succession, obtaining gold in all but one. 'This', I exclaimed to my guide 'is a memorable day in the history of New South Wales. I shall be a baronet, you will be knighted and my old horse will be stuffed and put into a glass case and sent to the British Museum'"

His rewards were not quite as great as expected, though he was made a mining commissioner. He did

though/.....

though, have the pleasure of seeing a remarkable change in his country. As more and more gold was found in the various states, the immigrants flocked into Australia. Railways were built, farming expanded and industry flourished. Many of the finds in Australia were extraordinarily rich and by the end of the century, Australia's total production had topped 3 000 tons as compared with the United States' 3 600 tons.

The state of Victoria has produced more nuggets and bigger nuggets than any other country in the world, lumps of gold in excess of 100 ounces being common. The largest nugget was the Welcome Stranger found at Moliagul near Dunolly on the 5th February, 1969. Its weight, after cleaning, was 2 284 ounces, about 70 kilograms. It sold for R10 500. The second largest, the Welcome, weighed 2 217 ounces and was found near Ballarat. Twelve nuggets were found exceeding 1 000 ounces. The largest hunk of gold found in Australia was not a true nugget as it was dislodged from a quartz vein by Holterman, in January 1872 at Hill End near Bathurst in New South Wales. It weighed, with the quartz, 630 pounds and was sold for R12 000. Its length was four feet nine inches.

The occurrence of such a large lump in quartz probably explains the origin of the large alluvial nuggets, but there is also considerable evidence, particularly in the gravels of Victoria, that certain nuggets have grown in situ. In these gravel deposits, gold crystals with sharp

edges/.....

edges have been noted. This is particularly evident in the 23 ounce Latrobe nugget. Incidentally, the purest natural gold was found in Australia on the Great Boulder Mine at Kalgoorlie. It is derived from a decomposed telluride ore and is quoted by MacLaren as being 999,1 fine.

The earliest gold workings in Southern Africa are shrouded in mystery. MacLaren reports that a strong Portuguese expedition set out in 1569 to seize the gold mines of Monomotapa lying west of Tete on the Zambesi River. The first expedition failed, but forty years later, the mines were amicably ceded to the Portuguese and several were worked, north and south of the Zambesi.

The Portuguese records also show that gold was mined in Rhodesia early in the sixteenth century. Many of the rivers in the eastern half of Rhodesia flowing over the granite escarpment have, through the ages, been washed for gold. Africans were, in very recent years, panning for gold in the Ruenya River, using wooden pans. Huffman believes alluvial gold was probably recovered in Rhodesia in the eleventh century. The earliest reliable evidence is the radio carbon dating of fire setting at the Geelong and Aboyne Mines, given as ± 1170 A.D. He also records that on the east coast of Africa, it was Arabs and not Indians who were trading gold in these early years, and this was a prosperous trade at the end of the eleventh century. This wealthy gold trade, he feels, led to the construction of Zimbabwe. Later there may well have been an alternative route down the Shashi River to the Limpopo, and hence the establishment of Mapungubwe, near Messina. The golden rhinoceros found on the top of this hill is further evidence of this trade.

In the Republic, both Davis and Marais claim to have found gold on the Witwatersrand well before Bantjes and the Struben brothers started their operations in 1885. Carl Mauch found gold in the Selati River at Tati in Bechuanaland and prophesied that it would be found near Lydenburg, but it was only on the 2nd January, 1871, some ten days after the Transvaal Volksraad had promised a reasonable

award/.....

reward for any find, that Button and McLachlan declared they had found gold at Eersteling near Marabastad, halfway between Potgietersrus and Pietersburg. The decision of the Volksraad to relax its restrictions on prospecting and, in fact, to encourage gold mining, had had immediate effects. The Eersteling Mine was South Africa's first established gold mine, admittedly not highly successful, but production was sufficient to support the twelve battery stamp mill. Incidentally, the chimney and boiler house, modelled on the Cornish style, were built with granite blocks imported from Scotland.

Thomas Baines visited Eersteling in December, 1871, but the picture of the rocking boulder used for grinding the ore before the arrival of the stamp mill, was painted later and is based on eye witness accounts. This rocking stone is now in the Pretoria Mineralogical Museum.

A year later, McLachlan and others found gold in the Sabie River on the farm Hendriksdal where Sabie is today. The gold was followed up to Graskop and then over the hill to Pilgrims Rest and down the Blyde River. There was talk that this was California over again and people from the Cape, Kimberley and Natal rushed to the field.

President Burgers visited the first camp in 1873 and christened it 'Mac Mac' because there were so many Scots men around the place. He came again a year later and bought a quantity of gold from which he had some 800 sovereigns minted in Birmingham. These are probably the most valuable South

African/.....

African gold coins of today. In 1882, with John McLachlan again the pioneer, gold was found in the De Kaap valley. This led to the Barberton field, initially spectacularly rich and one that attracted many who were later to be our leading mining personalities - Sammy Marks, Percy Fitspatrick, J.B. Taylor and Abe Bailey. But by the time the Main Reef on the Witwatersrand was found by Harrison and Walker in April 1886, the Barberton boom had fizzled out.

In July, J.B. Robinson arrived on the Witwatersrand from Kimberley with £20 000, lent to him by Alfred Beit. A major portion of this he had converted into gold coins and it is said that it was the sight of these gold coins in his gladstone bag that enabled Robinson to clinch his deals. Others were only offering promissory notes! Robinson bought several farms stretching from Langlaagte to Randfontein and thus laid the foundation for the great Randfontein Estates Mine. J.B. is supposed to have tested the gold potential of these farms by panning for gold using his white sun helmet, but Cartwright feels that Robinson was much too careful, or shrewd, a man to ruin an expensive twelve shillings and sixpenny hat for this purpose!

The steady development of the Witwatersrand is too well known to repeat. Production of gold in South Africa was slow to increase, the alluvial finds of the Lydenburg (Sabie) and Barberton fields could not compare with those of California or Australia, though nuggets up to 15 pounds were found. The better known Peacock nugget weighing 12 pounds was found in the Barberton district in 1912.

By the end/.....

By the end of the 19th century, South Africa's total production was some 666 tons as compared with Australia's 3 000 tons. Our more recent annual production has approached 1 000 tons.

There was one more dramatic gold rush before the 19th century closed. In August 1896, in the Yukon, Canada, Robert Henderson and George Washington Cormack with some Indian helpers, found gold while salmon fishing in the Klondike River. The problems of mining were many, since the gold on the bedrock of the river was covered with five metres of gravel and another five metres or so of black soil and peat which was continuously frozen. Fires had to be built to melt the ice before the little shafts could be sunk to get down to bedrock, but such is the lure of gold that, within three months, 30 000 people rushed to the field. Most of them came by sea to Skagway in Alaska and then within twenty miles of the landing, had to climb the 2 886 feet White Pass into Canada and the upper Yukon valley. There was then a further trudge of 570 miles to the diggings at Dawson, though it was possible to float rafts down the river. At the top of the pass, at the Canadian border, the North West Mounted Police would check the visitors' supplies since the Klondiker was expected to take in with him half a ton of food and equipment to keep himself alive. This was carried in short stages, at 100 to 150 pounds at a time. Little wonder that only one in three gold seekers reached their destination and only one in 100 found gold and became rich.

Production/.....

Production in the Yukon reached a maximum in 1900 and in the ten years to 1907, 180 tons of gold were produced. Placer and alluvial gold continues to be recovered in small quantities in the west of Canada. Canadian gold production, obtained mostly from gold quartz vein deposits in the pre-Cambria shield in Quebec and Ontario, reached a peak in 1941, in which year 165 tons were produced, compared with South Africa's 445 tons and the western world's 1 120 tons.

Gold production in Russia, up to the turn of the century, has been estimated in total as 2 000 tons. Since then production has increased and although most still comes from the alluvial deposits in Eastern Siberia, there is a growing output from mines in the Urals, Armenia and Uzbekistan. Estimates of recent production at 350 tons per year have been made, but Strishkov* is more conservative, and places last year's production at 215 tons with plans to increase to 277 tons in 1980.

The placer deposits are low grade and it is frequently reported that working costs are $100 per ounce. Russia exports her gold sparingly, using it only in times of necessity, as last year, when the grain harvest collapsed. Gold sales to the west by communist countries last year were 200 tons.

According to Union Corporation last year the western world produced 1 180 metric tons of gold, making a total supply, with communist sales, of 1 380 tons. 1 300 tons

were used/.....

* Annual Review - Mining Journal, London July 20, 1973.

were used for fabrication purposes, that is, used in industry and jewellery and the balance went into hoarding in banks, or into private hoards or moved in and out of speculative hands. During the previous year 1971, 1 410 tons were used for fabrication purposes and the drop in 1972 is ascribed to the higher price of gold which rose above U.S. $50 per troy ounce in April, reached $70 in August and finished the year at $65.

The demand for gold fabrication purposes has increased tremendously during the last ten years. The reasons for this are the rising standards of living in a world where numbers are increasing, the need for more sophisticated equipment requiring the best of constituent metals, the realisation that gold was under-valued and probably a more realistic appraisal as to the ultimate uses of gold. Some three-quarters of the gold used in fabrication goes into jewellery and the remainder is used for dentistry, for electronics and for general industrial purposes such as for colouring glass or making reflective surfaces which will remain bright and shiny indefinitely.

Of all the gold that goes into jewellery, rather less than half goes to the east, to India, Malaya, Indonesia and Hong Kong, where most of it is made into simple jewellery or medallions, much of it used as bridal gifts. The desire by these eastern people to own gold has long been insatiable, but with rising prices, it must be expected that the poorer countries such as India will have difficulty in making their imports.

In the western world, standards of living continue to rise, so too, unfortunately, have the prices of commodities. Since 1934, consumer prices in the United States

of America have trebled and yet consumer demand remains undiminished. A gold price of 3 x $35 = $105,00 is not, therefore, unrealistic in terms of depreciated currency; in fact, with growing consumption, the price could rise much higher should a shortage develop. For example, in terms of the rand, the present price of gold is FOUR times the price that it was in 1934; platinum seven times, tin eight, lead thirteen, copper twenty-one and zinc forty. Copper has doubled and zinc quadrupled its price since this time last year.

The greatest single use for jewellery is in rings. Rings were worn by the Egyptians more than 4 000 years ago. Initially they were light and plain, becoming heavier with prosperity. The Cretan and Grecian rings tended to be highly decorated. The Persians covered all their fingers with rings and the Romans in their heyday, put rings on their toes and even had summer and winter rings; but pity the poor Roman women during the Punic wars 215 B.C. when they were forbidden to wear more than half an ounce of gold. Their gold was required for the war effort.

Again in 1813, the women of Prussia were asked to hand over their gold rings to the state. In exchange they were given iron rings suitably inscribed 'for iron I have given gold'. Marriage rings are a very old custom and they have been worn on many fingers. The Gauls preferred the thumb. Tradition also has it that if the ring slips easily over the bride's finger, then the bridegroom will rule the home, but scheming brides know that a slightly bent knuckle obstructs the ring!

Other forms/.....

Other forms of jewellery have their particular qualities. Ear-rings are not subject to the hard wear of a ring, bracelet or brooch, they can be made from softer, finer gold and be more delicately fashioned. The Renaissance period shows a strong trend towards more intricate work, with the added luxury of precious stones and diamonds. Towards the end of the nineteenth century, goldsmiths started to use less expensive, but equally attractive materials such as mother of pearl, amber and ivory. This was called l'art nouveau and was brought to prominence by René Lalique, Georges Fauquet and probably the most famous of all, Peter Carl Fabergé. Each year Fabergé was commissioned by the Tsar to make a golden easter egg. In 1897 the egg contained a tiny scale model of the coronation coach and in 1901, to celebrate the completion of the Trans-Siberian Railway, a little locomotive made of platinum with coaches made of gold. But Fabergé's masterpiece was a basket of lilies of the valley given to the Tsarina Alexandra in 1896. The basket is woven from yellow gold, it is filled with moss, spun green gold wire, the stalks of the lilies are green gold, the leaves are of nephrite and the bells, pearls set with rose diamonds.

To craftsmen who have worked with gold, gold has, for all these years, been the perfect material. It is easy to fashion because of its malleability and ductility, yet it can be made to possess the most beautiful colours and these, because of the nobility of the metal, remain untarnished through the years. So far, there has been no substitute.

Gold has, therefore, intrinsic worth. It is not a mere piece of paper subject to the whims of politicians. It has, through the years, shown the world that it can withstand all attempts to degrade it. It has now survived the hurdle of a

major increase in production. It has once again proved that its worth is unassailable.

Present indications are that sales of gold for jewellery this year will be well down, some estimates being as low as 800 tons, as against last year's 1000 tons. The rapid rise in price to $120 during the mid year has caused some consumer resistance. Another 200 tons will be used for other industrial purposes, so that 1000 tons will be absorbed in fabrication this year.

Western production for 1973 is expected to be lower, close to 1100 tons, since South Africa has reduced her output through working lower grades of ore. If we assume that the communist countries again sell 200 tons, then total gold available will be 1300 tons, making a surplus of 300 tons for monetary absorption, hoarding and speculations. There is little doubt that under the present political strains, all this gold is being eagerly sought after and absorbed.

Further ahead one can predict a resurgence in demand for gold, for jewellery and industrial purposes. On the other hand, despite the higher prices of gold, all indications are that production will continue to drop, albeit slowly, for the next year or two, since the price increase has only now matched the increases in working costs. These have been going up steadily through inflation and through the necessity of mining at deeper depths under more difficult conditions. Demand is, therefore, expected once again to exceed supply.

Reference is frequently made to the large stocks of gold in the central banks. At the end of last year, this, for the western world, was 36 800 tons, with possibly another 12 000 tons in the communist countries. This is

the major/.....

the major asset which backs the paper currency of all these countries. The largest holder is the United States with 8 500 tons, followed by the International Monetary Fund with 4 700 tons.

The United States has already closed the gold window indicating that this is the bare minimum at which she wishes her gold reserves to stand. The I.M.F. would like to increase its holdings, but all member countries seem loathe to hand more over to the I.M.F. and lose further control of their own gold reserves. The problem, of course, is complicated by the rules of the I.M.F. which prohibit dealings in gold between members at prices higher than the recognised monetary levels. Nevertheless, the abandonment of the two tier system is clearly a step towards increased freedom in the movement of gold between countries, a condition which it is believed would considerably ease the repeated tensions that occur with the ups and downs of a country's economy. Countries would be prepared to exchange their gold if the prices were realistic. Japan has indicated that her gold reserves at 650 tons are too small for a country of her economic standing. It is felt, therefore, that if free trade were allowed, there would be as many buyers as sellers.

There is talk that the western world will, at some time in the future, adopt a numeraire other than gold, but as yet, the various countries have not reached that stage of sophistication in which they are prepared to trust politicians of other countries. Gold will continue to play a part, and if it is not to be used as the backing to the numeraire, the certainty is that it will be tightly held by individual countries as their reserves of last resort.

In conclusion/.....

In conclusion, I can do no better than quote from Sutherland:-

> "The winning of gold from the earth has for long been difficult. But the rewards, in value, in beauty and in permanence, are correspondingly great. Diodorus Siculus, in the first century B.C., summarized the matter with all the rhetorical antithesis of ancient writers. 'Nature herself,' he said, 'makes it clear that the production of gold is laborious, the guarding of it difficult, the zest for it very great, and its use balanced between pleasure and pain.'"

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GOLD PRODUCTION

The Middle Ages

In tonnes — After Heinrich Quiring

Country	Copper Age 3000 BC to 2100 BC	Bronze Age 2100 BC to 1200 BC	Iron Age 1200 BC to 50 BC	Roman Empire 50 BC to 500 AD	Barbaric Age 500 to 1000	Middle Ages 1000 to 1492
Egypt	700	570	410	30	12	10
Nubia	20	1020	510	50	75	49
Ethiopia	10	50	50	110	100	98
W. Africa		20	100	110	154	291
Rest Africa		60	345	20	23	26
Africa	730	1720	1415	320	364	474
Iberia	50	200	600	1000	13	15
Gaule - France		30	500	50	14	5
Great Britain		30	30	30	5	-
Italy		15	100	100	10	5
Carpathians		35	50	130	21	211
Rest incl. Balkans		90	530	400	85	187
Europe	50	400	1810	1710	148	423
Arabia	20	30	30	20	30	26
Asia Minor Cyprus	20	60	80	12	-	-
India	100	250	425	215	187	179
China		20	50	100	75	105
Siberia			10	5		
Misc.		165	300	190	130	171
Asia	140	525	895	542	422	481
Americas						160
Total World	920	2645	4120	2572	934	1538
Progressive	920	3565	7685	10257	11191	12729

Sheet 2/.....

GOLD PRODUCTION (Cont'd.)

Sixteenth to Nineteenth Century

	16th Century 1493-1600	17th Century 1601-1700	18th Century 1701-1800	19th Century 1801-1900
Nubia-Sudan	20	20	20	30
Abyssinia Somali	40	40	40	50
Rhodesia	2	2	2	14
West Africa	194	144	167	83
South Africa				666
Rest Africa	9	8	8	20
Africa	265	214	237	863
Spain, Portugal	4	6	6	-
Carpathians	136	100	106	150
Russia Siberia	-	-	-	2004
Rest Europe	44	17	21	53
Europe w. Russia	184	123	133	2207
India	20	20	20	104
China Tibet Korea	44	44	55	417
Japan	31	60	40	42
Rest Asia	30	43	46	100
	125	167	161	663
Colombia-Ecuador	140	356	476	377
Peru	23	50	55	45
Bolivia	56	104	72	69
Chile	48	35	86	128
Brazil	-	19	840	26
Mexico	24	38	91	216
U.S.A.	-	-	1	3589
Canada				224
Rest	39	2	2	434
	330	604	1623	5108
Australia				3006
New Zealand				456
Oceanica				3462
	904	1108	2154	12303
World Progressive	13 633	14 741	16 895	29 198

Sheet 3/.....

GOLD PRODUCTION (Cont'd.)

Twentieth Century

In tonnes	1901 to 1940	1941 to 1970	1971*	1972*	1901 to 1972
South Africa	10 761	17 700	975	908	30 344
Canada	2 134	3 580	69	65	5 848
U.S.A.	4 421	1 735	47	46	6 249
Australia, New Zealand	2 493	912	21	30	3 456
Russia	2 073				2 073
Other	5 977	7 016	135	133	13 261
Total	27 859	30 943	1 247	1 182	61 231
Communist Countries		15 000	20	200	15 220
World Total		45 943	1 267	1 382	76 451
Progressive	57 057	103 000	104 267	105 649	105 649

Production figures based on reports by Heinrich Quiring (Geschichte des Goldes) as tabulated by René Sédillot (Historie de l'or)

* Union Corporation Limited.

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