6th. Specimen of road stone with which Birmingham streets are macadamized.

7th. Ditto in a state of powder.

8th. Ditto, purified by hydrochloric acid.

9th. Specimen of sheet brass coated with silicium from this road stone.

Birmingham, 24th March, 1854.

Gold—Its Distribution.*

Notwithstanding the preceding sketch, it would ill become any geologist who throws his eye over the gold map of the world prepared by Adolf Erman, to attempt to estimate, at this day, the amount of gold which remains, like that of Australia, undetected in the vast regions of the earth, as yet unknown even to geographers; still less to speculate upon the relative proportions of it in such countries. At the same time, the board features of the case in all known lands may be appealed to, to check extravagant fears and apprehensions respecting an excessive production of the ore. For we can trace the boundaries, rude as they may be, of a metal ever destined to remain precious on account of those limits in position, breadth, and depth by which it is circumscribed in Nature's bank. Let it be borne in mind that, whilst gold has scarcely ever been found, and never in any quantity, in the secondary and tertiary rocks which occupy so large a portion of the surface, mines sunk down into the solid rocks where it does occur have hitherto, with rare exceptions, proved remunerative; and when they are so it is only in those cases where the rocks are soft, or the price of labour low. Further, it has been well ascertained, whatever may have been the agency by which this impregnation was effected, that the metal has been chiefly accumulated towards the surface of the rocks; and then, by the abrasion and dispersion of their *superficial* parts, the richest golden materials have been spread out, in limited patches, and generally near the bottom of basin-shaped accumulations of detritus. Now, as every heap of these broken auriferous materials in foreign lands has as well defined a base as each gravel-pit of our own country, it is quite certain that hollows so occupied, whether in California or Australia, must be dug out and exhausted in a greater or less period. In fact, all similar deposits in the Old or New World have had their gold abstracted from heaps whose areas have been traced and whose bottoms were reached. Not proceeding beyond the evidences registered in the stone-book of Nature, it may therefore be affirmed, that the period of such exhaustion in each country (for the deposits are much shallower in some tracts than in others) will, in great measure, depend on the amount of population and the activity of the workmen in each locality. Anglo-Saxon energy, for example, as applied in California and Australia, may in a few years accomplish results which could only have been attained in centuries by a scanty and lazy indigenous population; and thus *the present large flow of gold into Europe from such tracts, will, in my opinion, begin to diminish within a comparatively short period.* * * In conclusion, let me express my opinion, that the fear that gold may be greatly depreciated, in value relatively to silver—a fear which may have seized upon the minds of some of my readers—is unwarranted by the data registered in the crust of the earth. Gold is, after all, by far the most restricted—in its native distribution—of the precious metals. Silver and argentiferous lead, on the contrary, expand so largely downwards into the bowels of the rocks, as to lead us to believe that they must yield enormous profits to the skilful miner for ages to come; and the more so in proportion as better machinery and new inventions shall lessen the difficulty of subterranean mining. It may, indeed, well be doubted whether the quantities of gold and silver, procurable from regions unknown to our progenitors, will prove more than sufficient to meet the exigencies of an enormously increased population and our augmenting commerce and luxury. But this is not a theme for a geologist; and I would simply say, that Providence seems to have originally adjusted the relative value of these two precious metals, and that their relations, having remained the same for ages, will long survive all theories. Modern science, instead of contradicting only confirms the truth of the aphorism of the patriarch Job, which thus shadowed forth the downward persistence of the one and the superficial distribution of the other:—'Surely there is *a vein* for the silver.....The earth hath *dust of gold*.,'"

* *Siluria: or the History of the Oldest Known Rocks containing Organic Remains.* By Sir Roderick Impey Murchison.

The Society of Arts.

The Society of Arts was established at a meeting held on the 22d March, 1754, at which it received the designation which it still retains —"The Society for the Encouragement of Arts, Manufactures, and Commerce in Great Britain." The first stone of the present building was laid on the 28th March, 1772; the two brothers, Robert and John Adam, from whom the *Adelphi* derives its name, were its architects, and the Society first occupied it in 1774. Within the period which has since passed, many valuable inventions which now minister to our wants and our enjoyments, trace their origin to that association.—Many distinguished men owe to the opportunities it presented their eminence in public life; and favourable audiences have constantly, during the discussions of the Society blushed at the hesitating timidity of Goldsmith, and admired the profound and massive wisdom of Johnson. Its objects, like its means, were at first limited, but the six celebrated pictures in the Council Room, painted by Barry between the years 1777 and 1783, while highly illustrative of the state of the arts at that day, enable us in some degree to contrast the advance which civilization and science have since made in manufactures and commerce. With the Society of Arts originated the conception of the Great Exhibition of 1851; and in the Crystal Palace at Sydenham, on Monday the 3d July, it celebrated its centenary by a public dinner, at which nearly 800 persons were present, and over which Earl Granville, in the absence of the Duke of Newcastle, presided. The temple which then surrounded that assembly, dedicated to all the triumphs of ancient and modern art, would not now excite our admiration, exalt our race, and illustrate our age, were it not for the prudent and philosophic efforts of the humble but long unconscious founders of the early institution. A century hence will find those who joined in that celebration all equally silent; and it is beyond the speculative powers of the most reflective mind to anticipate what fresh triumphs genius, science, and art may unfold, to grace and adorn the revival of such an anniversary.

Electro-magnetic Engraving Machine.

This machine is somewhat on the principle of the well-known planing machine. The drawing to be copied and the plate to be engraved are placed side by side, on the moveable table or lid of the machine; a pointer or feeler is so connected, by means of a horizontal bar, with a graver, that when the bar is moved, the drawing to be copied passes under the feeler, and the plate to be engraved passes in a corresponding manner under the graver. It is obvious that in this condition of things, a continuous line would be cut on the plate, and, a lateral motion being given to the bed, a series of such lines would be cut parallel to and touching each other, the feeler of course passing in a corresponding manner over the drawing. If, then, a means could be devised for causing the graver to act only when the point of the feeler passed over a portion of the drawing, it is clear we should get a plate engraved, line for line, with the object to be copied. This is accomplished by placing the graver under the control of two electro-magnets, acting alternately, the one to draw the graver from the plate, the other to press it down on it. The coil enveloping one of these magnets is in connexion with the feeler, which is made of metal. The drawing is made on a metallic or conducting surface, with a rosined ink or some other non-conducting substance. An electric current is then established so that when the feeler rests on the metallic surface, it passes through the coils of the magnet, and causes it to lift the graver from the plate to be engraved. As soon as the feeler reaches the drawing, and passes over the non-conducting ink, the current of electricity is broken, and the magnet ceases to act, and by a self-acting mechanical arrangement the current is at the same time diverted through the coils of the second magnet, which then acts powerfully and presses the graver down. This operation being repeated until the feeler has passed in parallel lines over the whole of the drawing, a plate is obtained engraved to a uniform depth, with a fac-simile of the drawing. From this a type-metal cast is taken, which, being a reverse in all respects of the engraved plate, is at once fitted for use as a block for surface printing. The machine is the invention of Mr. William Hansen, of Gotha.—*Journal of the Society of Arts.*