

Wages.

The wages paid by the department to drill employés are: Foreman in charge, £4 per week; second and third foremen (if two or three shifts are employed), 10s. per day; assistants, 8s. per day. A shift consists of a foreman and two assistants, working eight hours.

Deflection in Bore-holes.

It has been claimed for the diamond drill by the original manufacturers that the bore-hole made by it must of necessity be straight and true; but it is alleged by some of the companies who have used the machines that in many cases a considerable deflection takes place in the course of a deep bore: in fact it is stated that a bore put down at Stawell deviated 50ft. in 400ft. from its initial direction. The discovery of this circumstance has led to the invention of an ingenious contrivance by means of which the extent and direction of the deviation can, it is said, be determined. The contrivance is known as MacGeorge's Gelatine Test or Patent Clinograph, and it has been fully described in the newspapers of the colony, which are unanimous in the opinion that the instrument will prove useful in connection with drilling operations whenever a knowledge of the exact direction and position of the bore-hole is a matter of importance. It is also claimed for Mr. MacGeorge's invention that it is capable of affording a true indication of the strike and dip of the strata passed through by the bore. Should such prove to be the case, the fact alone would be sufficient to render the instrument valuable in the prospecting of deep ground.

The clinograph has not, however, as yet been used by this department in connection with any of the Government drills, the Superintendent being of opinion that a bore-hole started in a true perpendicular direction must continue in the same direction to the end. He accounts for the reported deviation at Stawell by assuming that the initial direction of the bore must have been slightly out of the perpendicular, the variation increasing with the depth attained. It is but justice, however, to the inventor of the contrivance to give his views regarding bore-hole deflections, and I therefore subjoin a short extract on the subject from a paper read by him before the Victorian Institute of Surveyors on the 1st September, 1883, as follows: "It is perfectly natural for those who work diamond drills and have the charge of them, who never see the course of the hole which they bore beyond the first few feet of straight, who look at each length of drill-rod in its 10ft., or 15ft., or 20ft. of sturdy stiffness as a thing which cannot bend—it is perfectly natural for such men—intelligent good workmen, proud of their instrument, which has always taken gratuitous credit for boring straight, and so rarely has its winding path opened to the light of day—to disbelieve *in toto* that drills hardly penetrate 20ft. into the strata of the earth before they begin, at first by fractions, then by inches, then by feet, and at last by fathoms, to stray off from the course they should pursue. But if such men, intelligent and observant as they are, once saw 500ft. of such drill-rods jointed end to end, and lying upon uneven ground—to which this great jointed wire will readily adapt itself, and sag and bend with ease, because of its great length and its poor inch-and-a-half of thickness—they would no longer accept the doctrine of its infallibility as preached by diamond-drill manufacturers."

General Results.

With regard to the work done by the drills generally it may be stated that the machines have been highly successful in boring in basaltic rocks for deep auriferous leads, and in mesozoic rocks in search of coal-seams; but in boring through Silurian rocks in search of quartz-reefs, great trouble has from time to time been experienced, as, owing to the rapid alternations from soft to hard rock, and the existence of small and large veins of quartz, diamonds are very liable to be broken. Furthermore, in boring down to the water-level those rocks are more or less decomposed; and it has frequently happened that the bores could not be extended without the introduction of tubing. In fact, tubing has to be used in all cases where the rocks are soft, to prevent the falling-in of the sides of the bore-holes under the influence of the water which is constantly forced down from the surface in the working of the drills. The successful issue of boring operations also depends greatly, as already stated, upon the skill and judgment exercised by the persons in charge of the machinery, in the manipulation of the valves regulating the speed and pressure, so as to avoid breakage of diamonds. Skill and judgment are also required in preserving the bore-holes from injury by the water used in the progress of boring. The working of the drills with undue haste or pressure, so as to obtain greater speed in boring, is certain to result in enhanced cost, as, apart from the injury likely to be caused to the more delicate portions of the machinery, the extra loss of diamonds alone entails expense far in excess of the benefits derived by the greater amount of work actually performed. The value of the diamonds contained in a single bit is often over £150, and it will be seen, therefore, that, irrespective of the difficulty of obtaining these stones in any considerable number, the careful use of the bits in boring so as to prevent the destruction of diamonds is a matter of the utmost importance in regard to the economical working of diamond drills.

Particular Results.

Concerning the actual results obtained by those to whom the drills have been lent, mining companies using them have been somewhat reticent; but it is known that their use has led to the discovery of gold both in alluvial and quartz, notably in the mines of the G.G. Consolidated, the Madam Berry, and the Magdala companies; and there is every reason to hope that important discoveries will be made through some of the drills now employed in searching for coal. On the whole, there can be no doubt that, under efficient management, these machines are a valuable aid to mining.

German Drill.

Another description of drilling machine has recently been brought under the notice of this department by Captain C. Wagemann of this city. It is known as the German or Fabian boring drill, and it is claimed for it that it saves 33½ per cent. of the cost of boring with diamond drills.