

Engers, one at Neuwied, and one at Sahn; various quarries of clay, sandstone, etc.; four steamers, and artillery ground at Meppen, Hanover. The property owned extends over 974 hectares; and the number of hands employed in the mines and steel works is 25,301. There are altogether 1,500 furnaces of various kinds, 3,000 engines and machine tools, 22 roll trains, 111 steam hammers, 2 hydraulic presses, 263 stationary boilers, 421 steam engines, representing together a force of 33,139 horse-power, and 430 cranes, including travellers, having a collective lifting power of 4,662 tons. The total length of the shafting is 8.8 kiloms. (5½ miles), and that of railways, standard and small gauge, 85 km. (53 miles), worked by 32 regular trains, with 33 locomotives. The annual consumption of coal amounts to 1,253,161 tons, and that of lighting gas to 12,000,000 cubic metres (423,799 cubic feet), while there are 573 arc and 1804 incandescent electric lamps.

Nickel steel has just been exhaustively tried in the German navy for the propeller blades of small craft, and the results, it is stated, have been very satisfactory, particularly in respect of the absence of corrosion, which plays havoc with the screw propellers of torpedo boat craft, owing to the blades being very thin. In the course of the experiments the common steel propeller fitted to one boat was found after only three months to be badly corroded, while the nickel steel screw propeller was in good condition. Both boats were alike and had been subjected to the same steaming tests. A similar test was not so satisfactory.

Dr. John Haldane has presented to the Home Secretary a "Report on the Causes of Death in Colliery Explosions and Underground Fires," which is founded partly on the recent explosions at Tylorstown, Brancepeth and Micklesfield, and in which some fresh conclusions of the highest scientific and practical moment are arrived at. From an examination of bodies found after the fatal explosion in the Tylorstown pit it was established that many cases of death were due to poisoning by carbon monoxide, and this was supported by the symptoms experienced and described by members of the rescue party. Further evidence seems to point distinctly towards carbon monoxide being present in dangerous amount in the after-damp of all great colliery explosions. That insufficiency of oxygen does not account for the loss of life is shown by the fact that rescuing parties are sometimes driven back by an atmosphere in which at the same time the lamps burn quite brightly. Dr. Haldane believes that many lives have been lost through ignorance of the fact that the lamps, to which miners trust for the recognition of other gases, give no direct indication of carbon monoxide. In the Tylorstown explosion oxygen sufficient to support life must have been left in the air-ways all along the track of the explosion. At the very least 5 per cent. of oxygen, or 25 per cent. of pure air, must have been present. This fact came to the investigator as an entire surprise, and on further enquiry other evidence was obtained of the presence of oxygen even immediately after the passage of the flame. Dr. Haldane thinks it would probably be safe to assume that at least 50 per cent. of air is on an average contained in the after-damp along the traversed air-ways just after the explosion, and that at places there is 80 per cent. or more of pure air. Experiments on the lethal power of carbon monoxide, taken together with these data, leave it probable that the mixture of gases left along the track of the explosion contained on an average about 1 to 1½ per cent. of carbon monoxide, 50 to 70 per cent. of air, 4 to 6 per cent. of carbonic acid, and the rest chiefly nitrogen. The presence of 4 to 6 per cent. of carbonic acid would cause slight panting, but nothing more. Along with so much carbonic acid the deficiency of oxygen would have practically no effect, since the panting caused by the carbonic acid would increase the oxygen supply to the lungs, and thus compensate for the deficiency of oxygen in the air. The percentage of carbon monoxide present would be far more than sufficient to cause death, but the interval before death would certainly be considerable. The interval would amount to about 40 minutes or an hour. This, then, would be the interval

available for rescue. Loss of consciousness would occur much earlier, probably within 8 to 12 minutes.

The trial of the case of Lowenberg, Harris & Company vs. Joan Olive Dunsmuir was commenced this month in Victoria, B.C., before Justice Walkem. The plaintiffs are real estate and financial agents of Victoria, and the defendant is the widow of Hon. Robert Dunsmuir, the owner of the Wellington and other collieries. The plaintiffs sue for \$22,000 for expenses and loss of time in attempting to sell for the defendant the Wellington collieries. In September, 1890, according to the statement of claim, the defendant appointed Mr. Dennis R. Harris her agent for the sale of the collieries, and the price stated was \$2,600,000, and Mr. Harris was to get a commission of 5 per cent., which was to cover all his expenses. Mr. Harris then set out for New York, where he arrived at the time of the Baring Brothers' failure, and on account of which he decided to return to Victoria, as capitalists in London would not be likely to venture on his proposition just then. The negotiations were kept up by the plaintiff for some three years and eventually dropped. The last paragraph of the claim reads: "The plaintiffs submit that they in reality secured a purchaser for the said property for the price which the defendant eventually fixed for the sale of the same, and that they would have succeeded in effecting the said commission but for the difficulties placed in their way by the defendant and her agents, and the delays occasioned by her withholding instructions." In his evidence, Dennis Harris said he had received a statement from R. Dunsmuir & Son, which showed that the total profits for the Wellington mines, including steamships, for eight months in 1891, was \$347,162. Messrs. Dunsmuir at first wanted £35,000 for the steamers Wellington and San Mateo, but afterwards offered to include these with the mines and accept the original offer. Then they offered to take £100,000 debentures and £66,000 stock in the company which was to be formed to buy the mines. This colliery, which earned a profit of \$347,162 during a period of eight months in 1891, doubtless earned even more last year.

In the course of the discussion which followed the reading of Mr. William Beardmore's paper on nickel steel, Mr. James Riley, of the Steel Company of Scotland, gave some useful information as to the properties of this metal. He said there were, in the series of nickel steels, some most valuable properties to which the author of the paper had not referred. In all of them the susceptibility to corrosion was less than that of carbon steel, and it increased as the quantity of nickel increased, until, with 25 per cent. and upwards, the steel was practically non-corrodible. Then this alloy of 25 per cent. nickel steel had some other striking properties. It had great strength as well as wonderful ductility. It could therefore be flanged and stamped into forms with great facility, and it could be drawn into tubes or wire with perfect ease. A specimen was drawn into wire of surprising fineness, a piece weighing one kilo. being drawn into a thread of 21 kilometres long. Unfortunately that particular alloy had one great drawback—it was very difficult to machine. It might be punched without the least trouble, but it was almost impossible to drill a hole through it. There can be little doubt that in a very short time great use will be made of this alloy—one of the most interesting of the whole series. Possessing great strength, with very great ductility as well as non-corrodibility, it will speedily recommend itself in a thousand forms, notwithstanding that peculiar quality which renders it so refractory to machine tools. Think of the service this alloy might have rendered in the construction of the Forth bridge or the Eiffel tower! If these great structures had been built of a material of 40 tons strength instead of 30 in the one case and 22 in the other, the bridge would have become more light and airy and the tower more net-like and graceful than they are at present.

In a recent contribution to the proceedings of the North of England Institution of Mining and Mechanical Engineers, Mr. Henry Hall, one