“ On the construction of Roads on Deep Bogs and Moss. By W. Bald.”

Roads
over Bogs.

In this paper the author gives a detailed account of the construction of Roads through Bogs, and of the methods of securing the foundations of small bridges in boggy places ; also some suggestions on the formation of Railways on deep Moss.

The general principles are as follow. The first operation after laying out the line of road is to drain thoroughly the bog over which it is to pass. For this purpose main drains and counter drains parallel to the line of road are to be cut with a regular discharging fall along the bottom. Transverse drains must also be cut betwixt the main and the counter drains, so as effectually to drain off all the surface water and stagnant pools. The cutting of these drains must be carried on gradually, and by degrees ; if the bog be moist, the operations, which can only be carried on at dry seasons of the year, will probably have to be continued over three or four years before the drains become permanently fixed at the required dimensions. The counter drains are essential, as they relieve the pressure on the sides of the main drain, and consequently prevent it filling up. The bog stuff cut out is to be dried, and when the bog under the line of road has become sufficiently dry, the road is to be levelled, and made of proper shape, and the cross drains are to be filled with dry turf.

The road-way is then to be floored or trunked over with five courses of dry heathy sods, which are to be well rolled with a heavy cylinder. Upon this trunking is to be laid a soling, consisting of a mixed mass of prepared earth and gravel, of about six inches in thickness, and the whole to be coated with good clean gravel. The road metal is then to be laid on, in two successive coats, each of about three inches in thickness, the first being well consolidated before the second is laid on.

The great points to be aimed at are perfect drainage and good trunking, as, if these are not attained, roads constructed on bog will lose their shape, become ruinous, and soon go to decay.

Size of
hammers.

The author considers the form and size of hammers employed in breaking hard stones.

These are frequently too heavy ; a hammer weighing about a pound and a quarter, of an elliptical form, pointed at the ends, the area of end being about $\frac{1}{100}$ th part of a square inch, appears to be best suited for ordinary purposes.

Turf Fuel.

The turf of bog, being carbonized, makes excellent fuel, and may be employed in the manufacture of iron, and such iron is extremely

malleable. Turf fuel is also used most extensively in working the steam engine in many districts of Ireland; it is used on board the Dunally steam boat, for engines of eighteen horse power, and the expense is fourpence per mile.

June 26, 1838.

The **PRESIDENT** in the Chair.

Sir John F. W. Herschel, Dr. Faraday, and J. G. Children, Esq., were elected Honorary Members.

A discussion took place on the effect of turf fuel on iron, and on the methods and principles of hardening iron. Hardening Iron.

A communication was read from Mr. Buck on the relation betwixt the diameter and intermediate spaces of the tubes in a locomotive boiler, for the production of an unanimous effect in the generation of steam. Tubing Locomotive Boilers.

The following notice of subjects for **TELFORD** Premiums was read: Telford Premiums.
 The **COUNCIL** of the Institution of Civil Engineers give notice that they will award, during the ensuing Session, Telford Premiums to communications of adequate merit on the following subjects:—

1. The Nature and Properties of Steam, especially with reference to the quantity of Water in a given bulk of Steam in free communication with water at different temperatures, as deduced from actual experiment.
2. The Warming and Ventilating Public Buildings and Apartments, with an account of the methods which have been most successfully employed for ensuring a healthy state of the atmosphere.
3. An Account and Drawings of the original construction and present state of the Plymouth Breakwater.
4. The ratio, from actual experiment, of the Velocity, Load, and Power, of Locomotive Engines on Railways.
 - 1st. Upon Levels.
 - 2nd. Upon Inclined Planes.
5. The Sewage of Westminster.