

the signs + and - of each section. The wheels L and T of one train, and L₁ and T₁ of the other, are insulated from their trucks and joined by a conductor attached respectively to the terminals of the motor M and M₁. A current consequently is always passing from a + section to a - section through each motor. Mechanically then each train is supported by what is practically one continuous steel rod, but in reality at the tops of the posts the rods are electrically subdivided into sections and joined across by insulated wires, one of which may be seen at the top of the posts in Fig. 1. The wires connecting the two skeps with the motor, shown in Fig. 4, are not seen in Fig. 1, as they were too thin to appear in the photograph from which this figure was taken. To prevent the metallic wheels of the skeps short circuiting the two sections as they cross the tops of the posts, there are insulated gap pieces, which may be seen in Fig. 1, at the tops of the posts where the steel rod is electrically divided.

Various devices have been tried for gripping the rod to obtain the hold necessary to enable the locomotive to haul the train, and these, with many ingenious plans of *nest gearing* for economically communicating the power given out by the very quickly revolving electro-motor to the much more slowly moving wheels of the telpher locomotive, formed the subject of Prof. Jenkin's lecture at the Society of Arts in the spring of 1884. Practically, however, it is found that for moderate inclines direct driving, with pitch chains, of two wheels with india-rubber treads gives a gravitation grip sufficiently large for satisfactory haulage; hence the expense of the locomotive, the complexity and wear and tear of its parts combined with the risk of its getting out of order have been all most materially reduced during the last twelve months.

As the result of the experience gained in the construction of the Glynde line, it is estimated that a similar line could now be erected at short notice for a total cost of 1200*l.*, including engine, dynamo, permanent way, and five trains, with locomotives to carry 100 tons daily; the working expenses, including coal, attendance, and depreciation, being less than 3*d.* per ton per mile upon the material carried. A double line like that at Glynde, ten miles long, worked heavily, would carry material at a cost of 2*d.* per ton per mile, the skeps being empty on their return journey. The larger part of the original cost of the Telpher line is due to dynamos and rolling stock. This plant can be increased, as we are informed, in proportion to the work required, so that there is a very moderate increase of cost in the rate per ton per mile for a small traffic, as compared with a larger one. On the other hand, a line constructed for a small traffic will accommodate a much larger one with no fresh outlay on the line itself.

Leaving these facts and figures to speak for themselves, it now only remains to point out the advantages claimed for this system of electric carriage. In the first place the facility with which such a line can be run up and carried over uneven ground or across streams, high fences, and deep ditches, where an ordinary railway would involve serious expense, is sufficiently obvious. A Telpher line need not, as a railway necessarily does, impede the ordinary agricultural operations, but may be carried over fields and pasture lands with little inconvenience. The Telpher line is, moreover, in itself a source of power which can be simultaneously tapped at any desired points and made to assist in the work of agriculture, as the visitors on Saturday had an opportunity of witnessing when, by means of a motor connected with the line, a turnip-cutter was put into operation. The possibility of utilising natural sources of power like falling water, and of working the line at great distances from such sources will, as already stated, be evident to our readers. A special advantage claimed for the new system is the ease with which the trains can go round sharp curves without loss of power, since electricity, having no

momentum, experiences no loss in going round a corner, whereas, with the overhead wire haulage system, as used in Spain and elsewhere, there is both considerable friction and great wear and tear of the running wire ropes where they go round sharp curves.

The constructors of the Glynde Line are careful to point out that the present line is far from perfect; unnecessary gradients have been introduced in order to show how the system can be carried over uneven land, and many other improvements have suggested themselves in the course of their experience, of which advantage would be taken in future undertakings. In face of these disadvantages, the success which marked Saturday's proceedings renders Telpherage, as a system, a very hopeful and cheap method of transference, and the Company is to be congratulated in having taken the first initiative step in this new application of electricity. That Telpherage will ever come into serious competition with the large railways is not intended, for the statement made by the Company is to the effect that the function of the Telpher line is not to compete with railways, but to do cheaply the work of horses and carts, light tramways, and the wire rope haulage system, and this, we think, it has a good chance of successfully accomplishing.

THE MELDOMETER

THE apparatus which I propose to call by the above name ($\mu\epsilon\lambda\delta\omega$, to melt) consists of an adjunct to the mineralogical microscope, whereby the melting points of minerals may be compared or approximately determined and their behaviour watched at high temperatures either alone or in the presence of reagents.

As I now use it it consists of a narrow ribbon of platinum (2mm. wide) arranged to traverse the field of the microscope. The ribbon, clamped in two brass clamps so as to be readily renewable, passes bridgewise over a little scooped-out hollow in a disk of ebony (4 cm. diam.). The clamps also take wires from a battery (3 Groves cells), and an adjustable resistance being placed in circuit the strip can be thus raised in temperature up to the melting point of platinum.

The disk being placed on the stage of the microscope the platinum strip is brought into the field of a 1" objective, protected by a glass slip from the radiant heat. The observer is sheltered from the intense light at high temperatures by a wedge of tinted glass, which further can be used in photometrically estimating the temperature by using it to obtain extinction of the field. Once for all approximate estimations of the temperature of the field might be made in terms of the resistance of the platinum strip, the variation of such resistance with rise of temperature being known. Such observations being made on a suitably protected strip might be compared with the wedge readings, the latter being then used for ready determinations. Want of time has hindered me from making such observation up to this.

The mineral to be experimented on is placed in small fragments near the centre of the platinum ribbon, and closely watched while the current is increased, till the melting point of the substance is apparent. Up to the present I have only used it comparatively, laying fragments of different fusibilities near the specimen. In this way I have melted beryl, orthoclase, and quartz. I was much surprised to find the last mineral melt below the melting-point of platinum. I have, however, by me as I write, a fragment, formerly clear rock-crystal, so completely fused that between crossed Nicols it behaves as if an amorphous body, save in the very centre where a speck of flashing colour reveals the remains of molecular symmetry. Bubbles have formed in the surrounding glass.

Orthoclase becomes a clear glass filled with bubbles :— at a lower temperature beryl behaves in the same way.

Topaz whitens to a milky glass—apparently decomposing, throwing out filmy threads of clear glass and bubbles of glass which break, liberating a gas (fluorine?) which, attacking the white-hot platinum, causes rings of colour to appear round the specimen. I have now been using the apparatus for nearly a month, and in its earliest days it led me right in the diagnosis of a microscopical mineral, iolite, not before found in our Irish granite, I think. The unlooked-for characters of the mineral, coupled with the extreme minuteness of the crystals, led me previously astray, until my melometer fixed its fusibility for me as far above the suspected bodies.

Carbon slips were at first used, as I was unaware of the capabilities of platinum.

A form of the apparatus adapted, at Prof. Fitzgerald's suggestion, to fit into the lantern for projection on the screen has been made for me by Yeates. In this form the heated conductor passes both below and above the specimen, which is regarded from a horizontal direction.

J. JOLY

Physical Laboratory, Trinity College, Dublin,
November 1

NOTES

OUR readers will hear with regret that Prof. Huxley has placed in the hands of the Council of the Royal Society his resignation of the office of President, and that the Council have felt it their duty to accept that resignation. It would appear that Prof. Huxley had wished to resign so long ago as November last, when he had decided to winter abroad, and again, last summer, he definitely placed his resignation in the hands of the Council. On both these former occasions Prof. Huxley was induced to continue in office, in the hopes that he would soon regain complete health. On the present occasion we gather that the resignation was accepted, because, though Prof. Huxley is rapidly improving in health, the cares of the presidential chair seemed likely to prove a hindrance to his complete recovery being so rapid as could be desired. We feel sure that the whole scientific world will share the regret of the Council of the Royal Society at the necessity of such a step, but we also feel that every one must recognise the wisdom of the decision. We may add that every one hopes that freedom from the responsibilities of office may soon convert the marked improvement in Prof. Huxley's health, visible to all his friends, into complete and perfect restoration.

WE understand that Prof. Stokes has consented to allow himself to be nominated as Prof. Huxley's successor in the presidential chair. We believe that this choice of the Council will give universal satisfaction to the Fellows of the Society; while it makes Prof. Stokes doubly the successor of Newton, it does honour to the Society.

A CONSIDERABLE portion of the "Zoological Record" for 1884 has already been issued to subscribers; the Reports on Coleoptera, Lepidoptera, and Hymenoptera, by Mr. W. F. Kirby, were issued in September, and those on Reptiles, Fishes, Mollusca, Tunicata, Polyzoa, and Brachiopoda last week. The remaining parts are in a very forward state, Mr. W. L. Sclater, B.A., having undertaken the Mammalia in the place of Dr. Murie.

THE French Government has just created a certain number of travelling-juries. This is a modified form of an institution established by the first Republic. In the organic law of the Institut it was ordained that the Institut was to select yearly ten citizens to travel abroad and collect information useful to science, commerce, and agriculture. These scientific travellers will not be

appointed by the Academy of Sciences or the whole Institut, but by a special administrative commission on the basis of a competitive examination.

WHILE so much public attention is attracted by the second part of the Greville "Memoirs," it will interest our readers to learn that the acute and observant Clerk to the Council, who, on the whole, had a very low idea of the great men with whom he came in contact, possessed a great respect for the men of science of his generation. Under March 17, 1838, we find the following interesting entry ("Memoirs," vol. i. p. 78):—"Went to the Royal Institution last night in hopes of hearing Faraday lecture but the lecture was given by Mr. Pereira upon crystals, a subject of which he appeared to be master, to judge by his facility and fluency; but the whole of it was unintelligible to me. Met Dr. Buckland and talked to him for an hour, and he introduced me to Mr. Wheatstone, the inventor of the electric telegraph, of the progress of which he gave us an account. I wish I had turned my attention to these things and sought occupation and amusement in them long ago. I am satisfied that, apart from all considerations of utility, or even of profit, they afford a very pregnant source of pleasure and gratification. There is a cheerfulness, an activity, an appearance of satisfaction in the conversation and demeanour of scientific men that conveys a lively notion of the *pleasure* they derive from their pursuits. I feel ashamed to go among such people when I compare their lives with my own, their knowledge with my ignorance, their brisk and active intellects with my dull and sluggish mind, become sluggish and feeble for want of exercise and care."

THE first volume of "Geology, Chemical, Physical, and Stratigraphical," by Prof. Joseph Prestwich, F.R.S., will be ready for publication immediately by the Clarendon Press. This work is a general treatise on Geology adapted both for elementary and advanced students. Vol. I. treats of questions in chemical and physical geology, and special attention is paid to such subjects, among others, as Hydro-Geology, the geological bearings of the recent deep-sea explorations, volcanic action, joints, mineral veins, the age of mountain ranges, and metamorphism. Vol. II., which is far advanced, treats of stratigraphy and palæontology, and touches upon various theoretical questions. The author advocates the *non-uniformitarian* views of geology. The book is copiously illustrated with woodcuts, maps, and plates.

FATHER DENZA, according to the *Times* Rome correspondent, writing from the Observatory of Moncalieri, gives interesting particulars of a remarkable shower of dust which fell in various parts of Italy in the night of October 14-15. This dust-shower accompanied the violent gale of wind which occurred at the time, and seems to have fallen thickest in places situated more or less in the latitude of Rome. Father Denza regards the dust as meteoric. Mr. Abercromby writes to the *Times* to point out that this is probably premature, if by meteoric Father Denza means the product of meteors. But is it not probable that by meteoric sand he simply means sand which falls as "a meteor" or meteorological phenomenon? As Mr. Abercromby points out, this dust probably came from the Sahara.

AN interesting series of papers, copiously illustrated by charts, and comparative tables, is appearing in *Naturen*, on the climate of Norway. The author, Dr. Hesselberg, enters fully into the various causes on which depend the great differences between the inland and littoral climates, and notes in detail the varying relations of temperature for each month in the interior, and on the coast. From these tables it would appear that while in Norway, generally, the five months, from November to March inclusive, exhibit a purely winter temperature, no single month