THE VIAGRAPH: AN INSTRUMENT FOR MEASURING ROAD WEAR.

BY CHARLES LAVELL.

A most ingenious invention is the viagraph, an instrument for measuring and registering wear in road surfaces. During a recent dispute between the London County Council and a firm of paving contractors, it furnished data of the most valuable and unimpeachable character, putting into evidence facts which there was no disputing. In appearance the viagraph somewhat resembles a child's sled. Its body consists mainly of two parallel runners, 12 feet long, made of mahogany, with brass fittings. Between these, and protected from the elements by a glazed cover, is placed the recording mechanism, a combination of highly ingenious yet easily comprehended devices.

When the viagraph is prepared for a test, the principal recording factors—a steel-shod skate, shaped like a section of an ordinary cart wheel, 40 inches in diameter, and a cog-wheel—are both brought into contact with the surface to be surveyed. The skate and wheel are each connected, by means of delicately adjusted levers, with a paper-bearing cylinder, upon which, as the instrument travels, two lines are reproduced by means of pens; one records the profile of the road traversed in a more or less agitated line, on a scale of ⅛ inch to the foot; the other indicates a datum line. As the skate drops into a rut, so the lever connected therewith records the inequality upon the paper chart.

Not only does the instrument record in a profile map the inequalities over which it passes, but it places the fact in an even more comprehensive form by indicating, on a system of decimal dials, the sum total of such unevennesses in feet per mile. By means of a ratchet wheel and delicate triple pawl, the registration of upward movements, i.e., where the instrument passes over pebbles or other loose rubbish lying above the surface, is avoided.

It will be obvious that in order to compare the condition of one tested surface with another, a standard length of road must be employed as a unit. For this purpose, 88 yards, as being the 1-20 of a mile, is measured automatically upon the paper cylinder, and a bell warns the operator when this distance (represented by 33 inches of paper on the drum) has been covered, when his assistant immediately ceases towing.

By taking impressions of recognized excellent roads, comparisons can easily be made between the tested surface and others.

It is usual in making these tests to take several diagrams from the crown and sides of the road under survey, striking an average to arrive at the amount of depreciation.

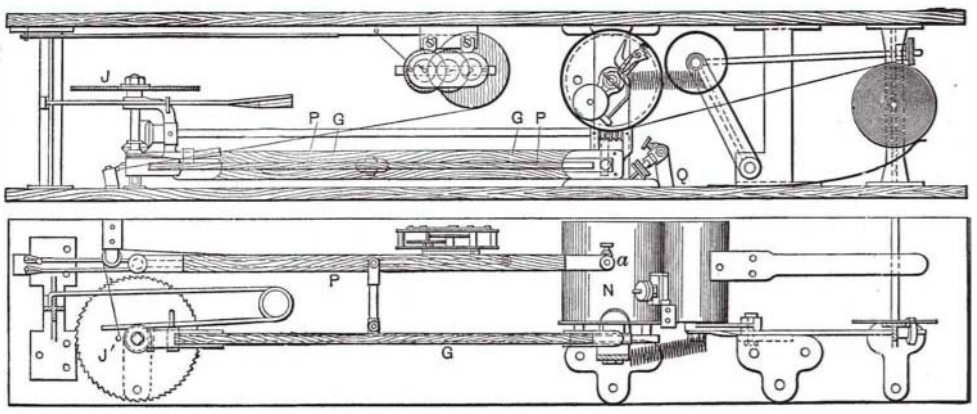
The following table has been drawn up, which will enable the surveyor to see at a glance under which head the road he has surveyed with the viagraph may be classified.

The instrument is drawn over the road under test by means of a cord, which should be handled intelligently, as uneven towage, jerking, or twisting the apparatus is apt to affect the accuracy of its results.

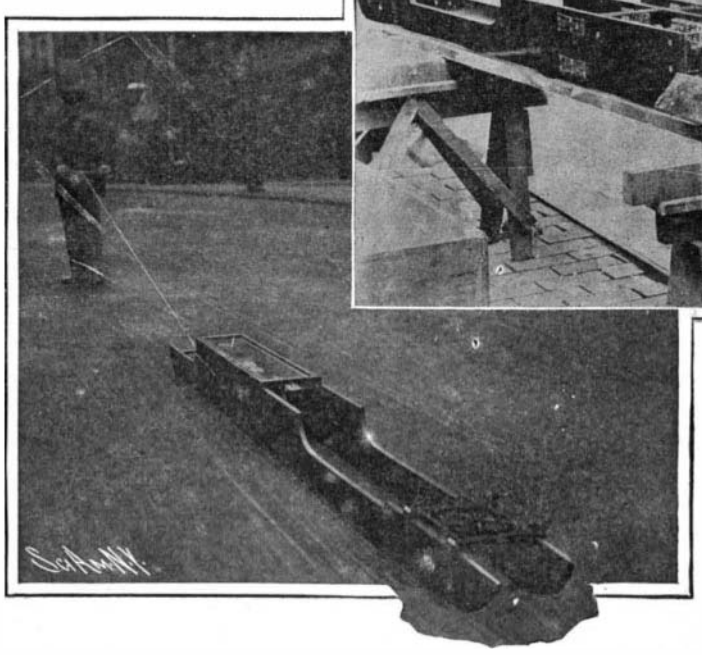
Such an instrument cannot be too highly recommended to the notice of road surveyors and others who are responsible for the making and upkeep of highways. In disputes between municipal authorities and contractors, the value of such an infallible means of checking wear and tear upon roads will be obvious.

Eye inspection in such cases is most misleading, and its value practically *nil*, because no two witnesses could estimate the depreciation alike. And in binding contractors to a definite quality in maintaining and laying down roads, the viagraph affords undeniable proof of its merits, as it will indisputably convict the contractor in the case of excess of wear or neglect—or worse.

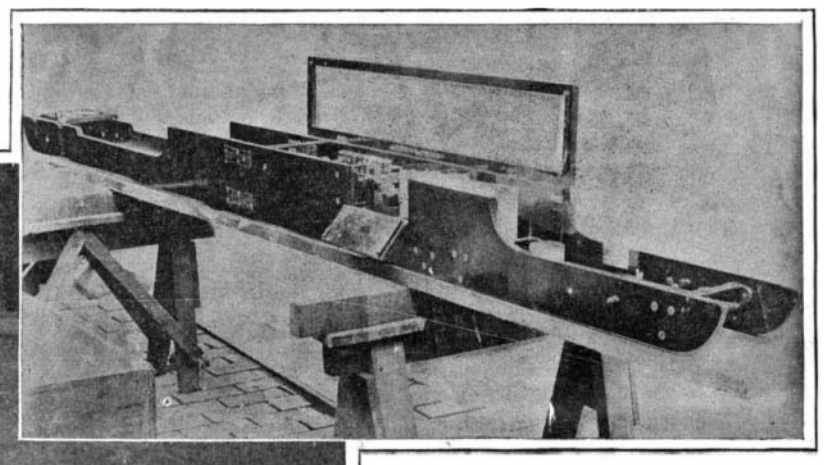
The writer is indebted to Messrs. Glenfield and Kennedy, of Kilmarnock, Scotland, N. B., for diagrams reproduced here.



The Operative Mechanism of the Viagraph.



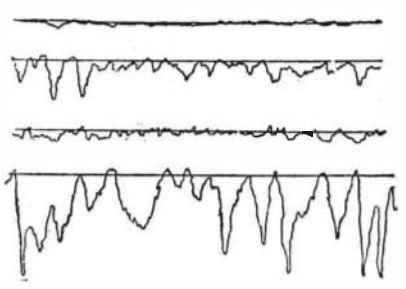
On the Road.



Showing Hinges Which Permit Runners to Fold Back for Easy Transportation.

Testing a Pavement.

Getting Ready for a Test.



Viagraph Tracings from Different Roads.

THE VIAGRAPH: A ROAD-TESTING MACHINE.

Numerical index of unevenness in feet per mile.	Condition of road surface.
15	Excellent.
30	Good.
45	Fair.
60	Passable.
80 to 100	Bad.

A new process, of taxidermal value, has been devised by an English naturalist, Mr. Charles D. Head, for stuffing animals and birds, the feature of which is that the objects are rendered life-like. The skins are made permanently soft and pliable, and can be moved freely into natural positions. The process is principally a specialty in skin-dressing, and free movement is left in every joint of the body. Another point is that the skins and feathers wear well, and can withstand considerable rough usage.

THE MAKING OF A GOBELIN TAPESTRY.

The art of transmitting ornamental figures or designs on the loom is probably nearly as old as that of painting them on a wall or a panel. The Egyptians, the founders of so many industries, knew at an early age the art of ornamenting fabrics by weaving, embroidery, and the application of colors. In the subterraneous temples at Beni-Hassan, the wall paintings, which date back to 3000 B. C., show the representation of an upright loom, which in general arrangement and even in detail is singularly similar to that used to-day. Nor are historical proofs wanting that the Egyptians of the time of the Pharaohs produced fabrics of extraordinary richness and fineness, which might be compared favorably with examples of the modern industry. The same may be said of western Asia and Greece. The ancient authors are unanimous in proclaiming the magnificence displayed by Babylon and Nineveh in textile hangings and carpets, and there are many records of the enormous prices paid by nobles and patricians of Rome for Babylonian tapestries. The oldest pieces of tapestry extant to-day do not date back further than the end of the twelfth century, and there are but a few of these. Undoubted evidence exists that all these specimens were produced in Germany about the year 1200. During the thirteenth century, tapestry making is supposed to have found its re-birth, and according to the old historians many important examples must have been produced, though only one exists to-day. The fourteenth century saw the rise of the art to great strength and importance, especially in France and Flanders. Paris, Arras, and Brussels secured for themselves the supremacy, owing to the skill of their weavers. The fifteenth century was the golden age of tapestry making, and the ateliers of northern France and Flanders rose to a height and attained a perfection in this art hitherto unknown, Arras eclipsing all its rivals. In this century the industry was started in Italy by emigrant weavers from France and Flanders, and soon the Italian painters furnished designs for tapestry, not only for their own weavers, but also for those of all other countries. The sixteenth century and the Renaissance consecrated the part the middle ages had assigned to tapestry, and saw the rise of the Italian weavers to an equal with those of other nationalities. In the seventeenth century occurred the establishment of the world-famous Gobelin factory in Paris, and from that time France steps into the front rank in the art of tapestry making, which it has held ever since. During the eighteenth century tapestry held its own or even increased in popularity though changing in style, but with the end of that century we come to the end of the last important era of the industry, followed by its gradual decay. Up to within a few years the Gobelin factory alone, of the innumerable ones formerly engaged in the industry, has continued in operation since the period above mentioned.

In recent years tapestry making has had a sort of revival, and thanks to the efforts of a few men of taste, is beginning to take its rightful place in the world of art once more. Besides the two factories of the French government, the Gobelins and the Beauvais, there are a number of private establishments of some importance in France, in Italy, and in Germany. A factory was started in England in 1876, but was