

at which it is being bent. As mentioned in Prof. Boys's note, the close or open coiling of the spring may be effected by slight inclination of the rod to the horizontal, and evenness in the winding is readily secured. When the coil is completed, it is removed from the rod by gentle tapping, and the hooked ends bent into the axis of the coil. We have observed no deterioration of the quartz due to the contact with the hot carbon rod, or to the use of coal-gas.

Spirals of fused quartz fibres of from 0.1 to 0.2 mm. diameter, having from 15 to 30 coils of diameter 0.5 to 1.5 cm., have been prepared in considerable number. Some large springs with coils of 2 cm. diameter were made to order by Messrs. The Silica Syndicate, and these had the same average extension per unit weight suspended from them as the spring of the same dimensions instanced by Dr. Sliupas. Considerably more sensitive springs have been manufactured, but they were too delicate for the purpose for which they were required. There appears to be small limit to the sensitivity that can be obtained, provided that the maximum load required to be carried be small. As an example of a typical spring which we are employing—of the less sensitive kind—we can get a spring that will carry a total load of approximately 0.8 gram, giving an extension of 0.9 cm. per 0.1 gram load; diameter of coils, 1.3 cm.

In the manufacture of long springs we have found it quite easy to join two or more fibres together, using the oxygen flame.

H. GREVILLE SMITH.

The University, Bristol,
June 22.

The Quantum Analysis of New Nitrogen Bands in the Ultra-Violet.

IN a previous letter (NATURE, 114, 642, November 1, 1924), one of the writers predicted a new group of nitrogen bands with an origin at about 65,000 μ , having for its initial state the final state of the first positive group, and for its final state the stable condition of the neutral molecule. A group of strong bands in almost precisely the predicted position has now been measured and analysed, but, contrary to expectations, the progressions of this group are not related to those of any other analysed group of nitrogen, or of any other substance.

The new group was obtained with purified nitrogen, at 0.003 mm. pressure, in a long tube, with flowing gas, using ordinary arc discharge. The spectrograms contain the usual nitrogen groups and in addition thirty bands, degraded to the red, extending from $\lambda 1354$ to $\lambda 1854$. Seventeen of the thirty have previously been observed by Lyman ("Spectroscopy of the Extreme Ultra-Violet," pp. 82 and 113). The distribution of intensity, except in minor particulars, is similar to that of the second positive group (a typical case), and hence indicates very definitely the correct assignment of vibrational quantum numbers. The resulting equation for the new group is

$$\nu = 68,956.6 + (1681.45n' - 15.25n'^2) - (2345.16n'' - 14.445n''^2),$$

where n'' varies from 0 to 9, and n' from 0 to 3 only, the average (Obs.—Calc.) being 0.1 \AA .

There are many other bands (or at least hazy lines) between $\lambda 950$ and $\lambda 1350$, some of which are quite strong, and also a few rather weak bands between $\lambda 1350$ and $\lambda 2100$, but as yet no consistent numerical relations are apparent.

R. T. BIRGE.

J. J. HOPFIELD.

University of California,
May 11.

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Sir William Fletcher Barrett, F.R.S.

IN Sir Oliver Lodge's notice in NATURE, June 6, p. 880, of the late Sir William Barrett he says that he (Sir William) "claimed" to have discovered some alloys of iron. Reference to published scientific papers would have shown Sir Oliver that Sir William read a paper in 1899, published in the Transactions of the Royal Dublin Society in January 1900, on the magnetic and electric properties of the alloy now known as stalloy, which is indispensable in the construction of transformers, dynamos, etc. Indeed he was told by an authority that this discovery had saved six million pounds in the construction of the Panama Canal alone. Another alloy, permalloy, is likely to be of even greater use in the future.

That Sir William did not do much more for original research was due to his extreme conscientiousness, in considering that, holding the chair of physics, his first duty was to his pupils, and no private work was ever allowed to interfere with that.

Sir Oliver further says that Sir William had "a stimulating hand in founding the Society for Psychical Research." It was entirely due to Sir William's initiative that the society ever came into being, in order to examine obscure psychical phenomena critically and scientifically. In this work he encountered much ridicule and hostile criticism, but he never suffered this or the undoubted obstacle thus created to his material advancement to hinder him in his arduous and devoted search for truth.

ROSA M. BARRETT.

I WELCOME Miss Barrett's supplementary letter about her brother's work. It is unsafe for a writer of an obituary notice to usurp the functions of a law-court to decide questions of priority or completeness of invention. "Stalloy" was, I believe, a subject of controversy, but those who knew Barrett well may hold that any claim made by him must have been well founded. As to the initiation of the S.P.R., Miss Barrett will find a notice in a forthcoming number of the Proceedings of that Society, wherein full credit is given him, with first-hand knowledge, by Mrs. Henry Sidgwick.

OLIVER LODGE.

A Geological Lecture Illustration.

THE following illustration, which occurred to me while preparing one of a series of talks to schools for the British Broadcasting Company, may be of interest to those who are concerned in teaching elementary geology, though it may not be new.

Almost every one has seen the heaps of sample carpets in large furniture stores. Let the carpets represent the successive strata as laid down in past time. Now suppose that a thick board or wedge be driven underneath the pile of carpets: this will produce a humping up of all the carpets just above the wedge. If we then suppose that the humped-up portion is subjected to continuous wear (denudation) it is quite conceivable that the upper carpets will be worn right through and the lower carpets (older strata) become exposed. The frayed edges of the worn-away carpets become the escarpments of the upper strata, and the analogy may be easily extended by considering carpets of different textures. Other types of deformation may of course be given to the pile, and the geological map subsequent on denudation easily deduced.

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