

X-Ray Fibre Photography.

WE have recently brought to a successful termination an investigation which was carried out to determine a combination of an X-ray generating plant and tube which would enable fibre photographs to be taken with exposures so low as to enhance the value of X-rays as a testing medium in the silk, wool, and allied industries. Fig. 1 is an X-ray photograph of ramie fibre of fifteen minutes' exposure. This exposure, however, greatly under-estimates the efficiency of the plant, since later photographs were produced with exposures of only thirty seconds' duration. This was repeated for wool and artificial silk.

A Laue spectrographic arrangement was used, and the fibres were subjected to copper radiation emanat-

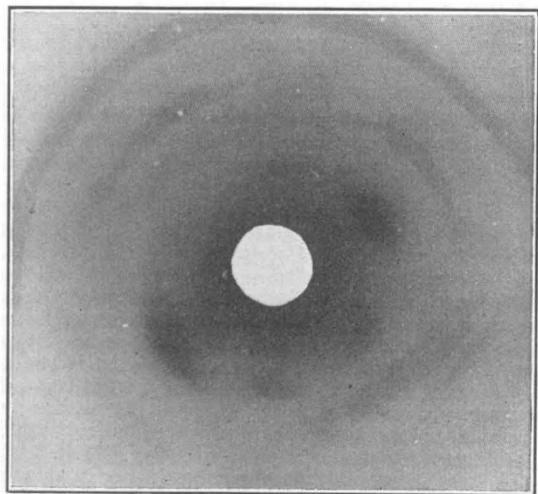


FIG. 1.—X-ray photograph of ramie fibre. The outer ring is due to brass of collimating tube.

ing from a Muller type water-cooled hot filament tube working at 10 m.amp. at 40 k.v. peak. The tube was fed by a D.C. generating plant consisting of a valve rectifier plant with smoothing condensers, arranged for an output of 30 m.amp. at 60,000 volts D.C. maximum.

We intend in the future to use a helium-filled Muller chrome iron tube with flat copper anode and fitted with four Lindemann windows. This tube will carry continuously, on rectified current, loads of 25 m.A. at 60 k.v. peak or 30 m.A. at 40 k.v. peak. This results in a treble output of that initially used, and in addition the tube is so designed that the anode to fibre distance is reduced by half. Thus we confidently expect to obtain X-ray fibre photographs with exposures of five seconds and even less.

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"The World List of Scientific Periodicals."

"THE World List", of which the first edition was published a few years ago, was an attempt to issue a complete alphabetical list of all the periodicals in all countries publishing the results of scientific research, in existence between 1900 and 1920, with standard abbreviations for the titles of each. The List contained the titles of approximately 24,000 periodicals. It was impossible that a work so costly to compile and to print could be self-supporting, and the publication of the first edition was made possible

only by grants from the Carnegie United Kingdom Trust and from private individuals.

The Royal Society of London, recognising the value to science of "The World List", has made a grant sufficient to enable us to undertake the preparation of a new edition. This is to be complete, so far as we can make it, up to the end of 1931. I shall be very grateful if librarians and others who have the first edition will send to the editor, Mr. W. A. Smith, Department of Printed Books, British Museum, Bloomsbury, London, W.C., a note of any errors they may have observed in the first edition, any omissions from it, and the titles of any existing periodicals containing the results of scientific research, in actual existence from 1900 up to the present, and omitted from the original edition.

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(Chairman, "The World List").

July 2.

'All or None': a Question of Nomenclature.

THE 'all or nothing' hypothesis represents such a clear-cut principle in elementary physiology that it seems a pity that the ambiguous phrase, 'all or none', should so often be used instead. We have been accustomed to suppose that a given physiological unit, or set of units, shows either 'all or nothing' of the response it can make under given conditions; also that additions to this response, under the same conditions but with greater stimulus, can be made only by co-operation (or, in a special context, 'recruitment') of additional units. This meaning is actually excluded by the nickname 'all or none', because we have supposed that 'some' units, few or many, fill in intervening stages of intensity of the response.

Moreover, recent and well-known work (such as the experiments at Oxford and at Cambridge on the spinal flexion reflex and on variation of electrical rhythm in sensory and motor units) demonstrates that 'all or none' of the active units can together modify their response. The alternative phrases now suggest two different principles, separately demonstrable in certain experiments—variability in number of units, each contributing its own 'all or nothing', and secondly, variability of contribution from 'all or none' of them.

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Polarisation of Raman Scattering by Hydrogen Gas.

THE theoretical work of Hill and Kemble, Manneback, and others, indicates that in the spectrum of the light scattered transversely by diatomic molecules, the rotational lines should be very imperfectly polarised. The Raman spectrum of hydrogen offers a particularly favourable case for an experimental test of this point, as the individual rotational lines are well separated from the exciting line. Working at a pressure of 50 atm. I have observed that the Raman lines representing the rotational transitions $0 \rightarrow 2$ and $1 \rightarrow 3$ in hydrogen gas are only weakly polarised, that is, to the extent of about 25 per cent; and that, on the other hand, the polarisation of the vibration lines appears to be sensibly complete.

By improving the experimental arrangements it has been found possible to eliminate stray light, and thus ensure that the light entering the spectrograph is exclusively that scattered by the molecules of the gas. Experiments are in progress to determine directly from the spectrograms the relative intensities of the Rayleigh and Raman scattering by various gases.

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