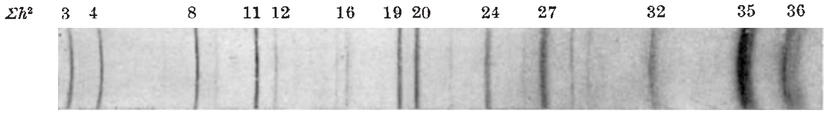
Target material and wave-length in A.		Linear absorption coefficient μ	
		Cu	Zn
0·559	Ag	236	201
0·585	Pd	265	233
0·613	Rh	303	269
0·708	Mo	443	391
1·339	Ga	3440	426
1·433	Zn	425	350
1·538	Cu	470	421
1·656	Ni	580	514
1·786	Co	720	620
1·933	Fe	882	780
2·100	Mn	1080	970
2·287	Cr	1370	1205

cleaning the cylindrical copper surface of the 4-in. diameter anode of a 'Gyrotron' X-ray tube[5], it was quite a simple matter to cover its slightly warmed surface with a uniform thin layer of gallium, simply by rubbing it on until it adhered. A continuous output of X-rays corresponding to a mean current of 80 m.amp. at 40 kVp. with focal spot dimensions 0·8 mm. × 8·0 mm. could easily be achieved. During the emission of X-rays, the gallium at the focal spot is, of course, liquid, but instantly freezes on moving away from the electron stream. So adherent is the film and so short is the period in which it is liquid, that no gallium is thrown off the anode surface due to centrifugal forces, nor, because of the efficient cooling, is there any intergranular attack which would cause disintegration of the copper base.



Debye–Scherrer pattern of gold wire taken with gallium $K\alpha + \beta$-radiation in 9-cm. diameter camera. Exposure 60 m.amp., 40 kVp., 1½ min.

Since the focal spot is small, the intense beam of gallium radiation may also be employed for X-ray diffraction work. A typical Debye–Scherrer diffraction pattern of gold wire in the 'as drawn' condition and taken in a 9-cm. diameter camera with gallium $K\alpha + \beta$-radiation is reproduced herewith. The exposure period, with the tube operating at only 60 m.amp. and 40 kVp., was approximately 1½ min.

The wave-length of gallium $K\alpha$-radiation is appreciably shorter than that of copper $K\alpha$. Thus, in suitable cases, much more information may be obtained from gallium radiation diffraction patterns than copper, since additional reflexions at higher values of $\sin\theta/\lambda$ are possible.

The availability of this new radiation emphasizes the advantages of a rotating anode X-ray tube over the conventional demountable tube fitted with a stationary target. Not only does it make more power available with normal radiations, thereby curtailing exposure times, but also its flexibility enables entirely new techniques to become available.

I should like to express my thanks to the Mond Nickel Co., Ltd., for permission to publish this communication.

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Applications of Multiple-Beam Interferometry

PROF. S. TOLANSKY[1] has made some comments on communications by Bruce[2] and Bruce, Macinante and Kelly[3] on the production and applications of transmission-like reflexion fringes. I am grateful for the reference to the paper by Lummer[4] in which the principle of eliminating beams in a Haidinger fringe system is mentioned.

The first of our communications refers to a Fizeau fringe system, where the relevant beams were eliminated practically, in a very simple manner. The transmission-like reflexion fringes so produced were used with particular success in vibration measurement. No claim is made for the extensive use of such fringes in the topographical study of small areas where high magnification is required. They have been produced in the low-magnification systems so frequently used in the interferometry of length.

It is not suggested that the reflexion fringes shown in the communication are the optimum in contrast, and it is agreed that reflexion fringes may be used in vibration studies; but we have found the transmission-like reflexion fringes a distinct advantage in our work.

The second communication, on vibration measurement, had been submitted for publication before we had seen the papers by Tolansky[5] and Tolansky and Bardsley[6].

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Sonic Layers in the Sea

THE article on 'scattering' layers in the sea by A. C. Burd and A. J. Lee in *Nature* of April 21[1] was read by us with much interest since such layers have been frequently observed in Scottish waters during the past three years.

The increasing use of the echometer as a fish-locating device during the past few years has raised the important problem of the assignment of characteristic echo traces to specific sound-reflecting surfaces. Hodgson[2] has shown that it may be possible at certain seasons and at particular times of the day to distinguish between shoals of several species of fish by the shape, density and texture of the echo traces; but traces are often obtained which cannot so readily be ascribed to particular organisms. Among these is the type, illustrated by Burd and Lee, which appears as a diffuse layer with the lower boundary frequently ill-defined; it is often recorded for long distances as an uninterrupted trace at varying depths from the sea-bed. For example, in our records such traces have extended for distances up to 35 miles on the