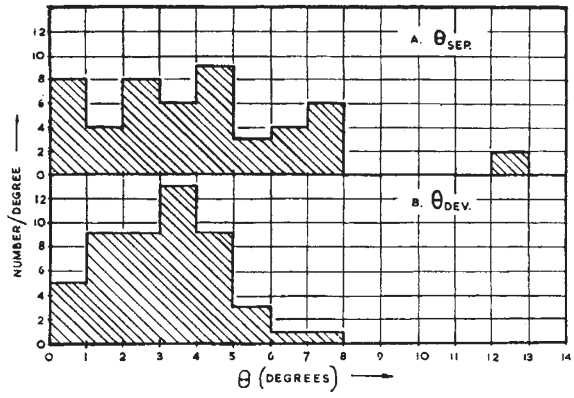

Fig. 2. The observed distributions of: (*a*) $\theta_{sep.}$ angle between the two tracks of a pair at the origin; (*b*) $\theta_{dev.}$, inclination of the bisector of the pair to the beam direction

of the γ-rays observed in the cosmic radiation at great altitudes. A comparison of the intensity and the energy distribution of this radiation with the corresponding quantities for the π-mesons observed to be created in the same plates, as 'shower' particles, is of great interest because of its bearing on the problem of the origin of the 'soft' component; and, in particular, in connexion with the possibility that the latter arises through the decay of short-lived neutral mesons into γ-rays.

I am indebted to Dr. F. E. K. Goward, of the Ministry of Supply, who made the exposure to the synchrotron, to Dr. R. H. Herz, of Messrs. Kodak, Ltd., who provided the plate, and to Prof. C. F. Powell for much helpful discussion.

D. T. KING

H. H. Wills Physical Laboratory,
University of Bristol. Jan. 5.

[1] Coates, A. C., and Herz, R. H., *Phil. Mag.*, **40**, 1088 (1949).
[2] Goldschmidt-Clermont, Y., King, D. T., Muirhead, H., and Ritson, D. M., *Proc. Phys. Soc.*, **61**, 183 (1948).
[3] Davies, J. H., Lock, W. O., and Muirhead, H., *Phil. Mag.*, **40**, 1250 (1949).

Ultra-Sensitive Portable Gamma-Ray Spectrometer

IT is the purpose of this note to report the construction of a new type of portable detector of the crystal variety, which has been operated with considerable success in northern Canada during the summer of 1949 in the search for uranium. A crystal of approximately 100 gm. is used as the gamma-sensitive scintillation element and, with an integration time for counting of a few seconds, a detection sensitivity of 10^{-10} R./sec. has been achieved. The use of miniature hearing-aid components has been employed to keep the weight of the complete unit down to 8 lb. Details will be published later. However, one noteworthy feature of the device is its operation as a 'proportional' counter or crude gamma-ray spectrometer, in the sense that the differential pulse height distribution gives a measure of the energies of the gamma-rays[1]. Photo-electron conversion lines and Compton recoil 'edges' are employed to identify these energies. In particular, thorium is easily identified by the Compton recoils due to the strong 2·62 MeV. gamma-ray.

Two complete instruments were operated in the Lake Athabaska and Black Lake districts of northern Saskatchewan for a period of two months, during which time some hundreds of miles of rugged country were traversed and several complete radiation surveys were made of known and hitherto unknown radioactive deposits. The instruments behaved in a completely satisfactory manner with regard to stability and sensitivity, and it was found possible to detect substantial deposits of uranium ore at distances of several hundred feet. The method employed in the investigation was to draw radiation contour maps using lines of equal gamma-ray intensity or 'isorads'. In this way the surface distribution of intensity could be adequately represented and the relationships of the various geological features made more clear.

In some cases extremely complex patterns of active shear zones, bedding planes, and cross-fractures were found. We were able, on more than one occasion, to compare the surface distribution of activity with the distribution of radioactive materials which was found after the removal of overburden. Anomalies in the relations of the two distributions were attributed to the emanating power of the ore body itself and the consequent diffusion of radon to the surrounding rock or soil. The relative contribution of cosmic-ray particles to the total counting-rate, several hundred thousand counts per minute in active areas, was found to be quite small. This was verified by aeroplane flights some of which showed convincingly the feasibility of using this method of detection for radioactive prospecting from the air. We have assured ourselves, also, that we have an instrument of value for the rapid investigation of geological formations and rock contacts, as determined by changes in trace quantities of radioactive materials. Relatively high readings are obtained over granite and acid rocks and, of course, over pegmatite intrusions.

The ultimate significance in civil defence of extremely sensitive detectors of the type we have been using is not difficult to appreciate.

ROBERT W. PRINGLE
KENNETH I. ROULSTON

Physics Department,
University of Manitoba.

GEORGE M. BROWNELL

Geology Department,
University of Manitoba.
Sept. 6.

[1] Pringle, R. W., Roulston, K. I., and Taylor, H. W., [*Rev. Sci. Instr.* (April 1950)]. Pringle, R. W., Standil, S., and Roulston, K. I., [*Phys. Rev.* (March 15, 1950)].

A New Type of Lattice with Large Periods in Silk

SINCE writing the communication entitled "An Unstable Lattice in Silk Fibroin"[1], a further modification of silk has been found which can be prepared by treating 'silk II' with 0·5 per cent sodium hydroxide at 60–70° C. for about a minute. We suggest that this new type of silk be called 'silk III'. It shows all the interferences of 'silk II' and in addition the equator net-plane distances shown in the accompanying table.

8·9 A. (medium)	23 A. (weak)
11 ,, (weak)	31 ,, (extremely weak)?
15 ,, (medium)	45 ,, (very strong)

From X-ray investigations of 'higher oriented' samples[2], it seems most probable that the 45 A. reflexion can be ascribed to a net-plane coinciding with the 'grid' formed by the backbone and the hydrogen bonds[3]. The other reflexions, except the 31 A. reflexion, the existence of which is still rather doubtful, represent the second, third, fourth and