is in contrast to the predominant downward motion of other prominence types but coincides with the characteristic motions of the 'surges', first discovered at the McMath–Hulbert Observatory. Surges have also been strikingly recorded in the films of solar phenomena taken by Menzel and Roberts at Climax.

There is, therefore, a remarkable similarity between the observed motion of the flare surges and the deduced motion of the radio noise source-points. It is suggested that this outward blast of particles, ejected possibly by the pressure of $L\alpha$ radiation in the flare flash, sets up turbulence and plasma oscillations in the ionized medium above the seat of the flare. These turbulent motions would generate radio waves of the observed frequencies. The visible column of material, which emits $H\alpha$ light, may form only a small fraction of the total matter expelled at these times: if the remainder is ionized it will be unobservable in the spectrohelioscope.

Clearly, it is important to try to link up the two sets of phenomena by simultaneous observations in the radio and visible wave-bands during the course of a single flare.

Note added in proof. A paper by J. P. Wild[12], dealing with the radio spectrum of these outbursts, has just come to hand. They are tentatively ascribed to the outward passage from the flare of particles which, in favourable circumstances, reach the earth about a day later, causing terrestrial magnetic storms.

M. A. Ellison

Royal Observatory,
Edinburgh 9. April 23.

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Radium and Deep-Sea Chronology

Collaboration between Austrian, Norwegian and Swedish specialists gave the first accurate measurements of the content of uranium and radium in sea water[1]. These results have recently been confirmed by measurements on much more extensive material collected during the Swedish Deep-Sea Expedition[2]. Whereas uranium remains fairly constant (average content $1\cdot3 \times 10^{-6}$ gm. per litre), the radium content is more variable, averaging about $0\cdot07 \times 10^{-12}$ gm. per litre or 15 per cent of the theoretical value in equilibrium with the dissolved uranium. I have suggested that this lack of radium in ocean waters is due to precipitation of its parent element ionium together with ferric hydroxide[3]. This would also explain the surprisingly high radium content found in the surface layer of red clay and radiolarian ooze as ionium-supported radium, decreasing downwards with the half-period of ionium, 83,000 years. Such a falling-off in radium content was first demonstrated in long cores by Piggot and Urry[4], and has been used in their attempts to estimate the rate of sedimentation.

Attempts made here and in the Institut für Radiumforschung in Vienna to apply the same method to age-determinations in cores from the *Albatross* cruise have not given such smooth curves as those published by Urry. The radium content often varies irregularly with 'depth' below the surface of the sediment, indicating that secondary processes like diffusion, adsorption, etc., interfere with the regular distribution of radium to be expected from the decay of ionium *in situ*. Approximate age determinations have, however, been made by this method applied to some of our cores from the Atlantic and the Central Pacific Ocean.

Another method of determining the rate of sedimentation from radium measurements is the following. From the amount of uranium-produced ionium in sea water precipitated on to the sea bottom from a water column of given height, a theoretical maximum value of the radium in equilibrium with this ionium, attained after about 10,000 years, can be found. Comparing this theoretical value with that found by measurements, the dilution due to non-active components and hence their rate of sedimentation can be found.

A detailed analysis for radium made on thin sections from the uppermost part of a core taken about 240 miles north of Tahiti (lat. 13° 25′ S., long. 149° 30′ W., depth of water 4,630 m.) gave a rather diffuse maximum of 50×10^{-12} gm. radium/gm., situated about 1 cm. below the surface of the sediment. Comparing this with the maximum value of radium carried by ionium to be expected from the precipitation of ionium from the superposed water column, the dilution with fresh sediment is found to require a sedimentation-rate of about 0·5 mm. in a thousand years. Allowing for the spread of radium from the theoretical maximum as indicated by the measurements, a 20 per cent higher maximum value and a corresponding reduction in the rate of sedimentation to about 0·4 mm. in a thousand years would follow. This is in good agreement with the rate of sedimentation derived from the general falling-off in radium content within the uppermost 15 cm. of the same core, namely, 0·4 mm. in a thousand years.

The method here described obviously gives a value for the 'actual' rate of sedimentation, if by 'actual' is meant the average value for the past ten thousand years. The results emphasize the importance of collecting cores from deep-sea sediments with as little disturbance of the uppermost top layer as possible, and of submitting this layer to detailed analysis for radium. The same method is now being applied also to other cores with varying rates of sedimentation, and corresponding variations of radium content in the layer of maximum concentration. Details will appear in the Reports of the Swedish Deep-Sea Expedition, to be published by the Royal Society of Gothenburg.

Hans Pettersson

Oceanografiska Institutet,
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Spin of Sodium-24

An atomic beam apparatus using magnetic resonance[1] has been built and used for finding the spin of sodium-24. The focusing magnets and the radio-frequency section are similar to those used by Davies[2] for studying the spin and hyperfine structure of sodium-22. The intensity of the sodium-24 beam was found by collecting on a target and afterwards measur-