A highly important feature of the process has been established by an examination of the precise mechanism by which the accreted hydrogen is absorbed into the outer layers of the sun. This shows that most of the kinetic energy brought to the sun is re-emitted in the form of ultra-violet radiation, so that even in encounters in which only a one per cent change of total luminosity occurred, the increase would nearly all be in the ultra-violet region of the spectrum. This would represent a manifold increase in this range of wave-length over the normal amount (which at the present time is largely contributed by this same process taking place at a much more moderate rate than envisaged for the ice age periods).

This source of variation in both the quality and quantity of the solar radiation as a possible hypothesis for explaining the ice ages first presented itself as a result of indirect arguments involving questions of stellar evolution. At that time no observational evidence of a clear-cut nature was available on many of the factors concerned, for otherwise the ideas might well have been arrived at before. But considerable evidence on many aspects of the accretion process has accumulated since, all of which there is not space to examine here. The simplest example is provided by direct observations that have recently been made of certain dwarf stars whose spectra show anomalous hydrogen emission lines of far greater strength than would usually be associated with their prevailing low surface temperatures. The presence of these lines demands an excess emission in the ultra-violet approaching 10 per cent of the luminosity of the star, and moreover the stars concerned are seen to lie in dense regions of interstellar gas.

It may thus be concluded that there is now incontrovertible astronomical evidence of both a theoretical and an observational kind showing that the radiation reaching the Earth from the sun will in the past have been subject to irregularities of increase of the type described above. What the exact consequences of these will be in regard to terrestrial climate is not of course the province of theoretical astronomy, but the probability is strong that an adequate first cause of the major climatic variations lies here.

CORRESPONDENCE

The Editor,
The Journal of Glaciology

SIR,

Snow Conditions in the Lebanon

On 11 September 1949 considerable snow patches were visible on the northern slopes of the Lebanon mountains, some 18 miles (29 km.) south-east of Tripoli, the lowest snow being at 7700 ft. (2347 m.). Above this level there were patches on all the north faces. A crescent-shaped patch, some 280 yd. long and 50 yd. wide (256 × 45 m.) was found between the twin peaks of Qornet es Saouda (10,115 ft., 3083 m.). The northern edge of this patch terminated in a steep face estimated to be about 35 ft. (10·7 m.) deep. This snow bed was continuous, with a strip of snow at its eastern end which extended a further 500 yd. (460 m.) down the northern side of a gulley.

All the snow beds observed were well weathered by a series of crescent-shaped pits up to 8 ft. long, 3 ft. wide and 5 ft. deep (2·5 × 1·5 × 0·9 m.). These lay close together in regular order, each running approximately north and south. They did not appear to be wind-formed.

During the 1948–49 snow season the first snow fell in November and the last in May. Ski runs were possible down to about 6230 ft. (1900 m.).

P.O. Box 150,
Tripoli,
The Lebanon
20 *October* 1949

V. I. RUSSELL

https://doi.org/10.3189/S002214300001282X Published online by Cambridge University Press