light of an age sequence (as outlined by evolutionary tracks of galactic clusters) both young and old binaries are represented. A group of visual binaries has been identified where one (the fainter) or both components are still in the stage of gravitational contraction. For the majority of stars an age of 5×10^9 years has been postulated. However, there are indications that a few stars may be as old as 10×10^9 years. Cases where the secondary components are situated above or below the main sequence can also be understood on the basis of stellar evolution.

Research for this work was done at David Dunlap Observatory.

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Beals, C. S. and Millman, P. M. *A comparison of sub-surface materials from two meteorite craters.*

The non-meteoritic sub-surface materials of the Barringer and Holleford Craters have been compared on the basis of extensive sampling for each crater. With the co-operation of the Barringer Crater Company, specimens of material were collected from various positions in a shaft 50 ft deep, located 500 ft from the center of the Barringer Crater, and also from a horizontal tunnel, 350 ft long, whose entrance was on the inner wall 1,350 ft from crater center at a vertical depth 350 ft below the rim.

The specimens contained particles ranging in size from irregular pieces several inches across down to microscopic grains of dust. The grain size distributions for eight samples were determined by the Division of Building Research of the N.R.C. and several types of grain size distribution curves were found.

Drill cores were obtained from the Holleford crater at distances of 1400, 2500, and 3750 ft. from the center and at depths varying from 65 to 1128 ft. Particle sizes ranged from gross rocks down to microscopic grains only clearly visible in thin sections.

A mixture of materials from the Barringer crater was set in cement and drilled. The resulting artificial cores showed a remarkable similarity to the drill cores from Holleford, the main difference being the darker color of most of the materials from the latter crater. General studies of the nature of the rock fragments including thin sections of cores from both craters suggest

that the sub-surface materials were produced *in situ* with a minimum of subsequent transportation by wind and water.

These observations reinforce evidence from depths, diameters and profiles (Beals 1958) indicating that the mechanical process responsible for shattering the rock and hollowing out the depression was the same for both craters.

REFERENCE

Beals, C. S. 1958, *Sci. Amer.* **199**, 39.

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Broten, M. W. and Medd, M. J. *Absolute flux measurements of radio sources at 9.37 centimeters.*

Measurements at a wavelength of 9.37 cm of the absolute flux level of the brighter radio sources were made during 1959 at the National Research Council's radio observatory near Ottawa.

The radiometer consists of a traveling-wave-tube receiver having a bandwidth of 450 Mc/s centered on 3200 Mc/s. The sensitivity is sufficient to allow observations to be taken with a ten-foot parabolic reflector as telescope. The experimental procedure eliminates the necessity of measuring the background radiation; the effective antenna temperature was determined by comparison with a heated resistive element or hot load; and the gain function of the reflector was obtained by comparing the antenna temperatures derived from daily measurements of solar emission with the reflector and with a 4-foot by 3-foot aperture standard horn. By this method it is estimated that a probable error of about five per cent may be assigned to the flux values of the radio sources.

In units of 10^{-25} watts/m²/c.p.s. (two polarizations) values of flux for Taurus A, Cygnus A, and Cassiopeia A, are respectively: 71, 67, and 132.

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Brownlee, Robert R. and Cox, Arthur N. *Time-dependent stellar models.*

High speed computing machine calculations of solar mass interior models are described for two cases. The method of obtaining the two