OUR ASTRONOMICAL COLUMN.

THE SUPPOSED NEW COMET.—Ephemeris Circular No. 492 of the *Astronomische Nachrichten* contains a notice from Prof H. Kobold, Kiel, announcing that Prof. Frost has identified the supposed new comet discovered by Mr. J. E. Mellish on September 6 with N.G.C. 2261.

STAR COLOURS.—There are two methods by which the colours of stars are being determined:—(1) the direct method, in which a coarse objective grating is used, and estimates made of the mean effective wave-lengths of the light from the stars; and (2) comparison of the relative intensities of two separate regions of the stellar spectrum. As usually effected, this is an indirect method, based on measures of photographic and visual (or photovisual) magnitudes. Three recent contributions from Mount Wilson Observatory, (*Astrophysical Journal*, vol. xli., No. 1) deal with this subject. In one of these Prof. E. Hertzsprung presents an account of his researches on the stars in the cluster N.G.C. 1647 by the grating method used in conjunction with the 60-in. reflector of the Mount Wilson Observatory. Photometric magnitudes and effective wave-lengths are given for rather more than 200 stars in the cluster. In the case of 44 stars, a comparison of the measures of effective wave-length are compared with a rough classification of the spectrum. Partly from this paper, Mr. F. H. Seares derives data for a comparative study of colour-indices measured indirectly with those obtained by transforming effective wave-lengths. Results for 47 stars of magnitudes between 11·5 and 15 indicate that for this interval the two series of colour-indices show the same increase in mean colour with increasing magnitude. In the remaining paper, Prof. Hertzsprung discusses the mean effective wave-length of a number of absolutely faint stars. Effective wave-lengths show little change for stars of abs. mag. +3 and +8, the values lying between λλ 4500–4600. The suggestion is made that the abs. mag. +3, corresponding to a temperature of 3400° abs. for a black body the size of the sun, represents the stage of a cooling star at which relatively dark solid matter begins to form on its surface.

RAIES ULTIMES.—Comte A. de Gramont designates by this term those lines in the spectrum of an element which for any given source of luminescence persist longest as the percentage of the element is reduced. They are thus lines of maximum sensitivity. In a paper lately published (*Ann. Chem.*, vol. iii., May–June, 1915) it is pointed out that the effect of reduction of quantity of substance should not be confounded with diminished exposure in photographing the spectrum. The one operates on the spectrum, the other acts merely on the record. The persistent lines are not identical in the two cases. It appears that in general the vestigial spectrum is not of necessity made up of remnants of the strongest lines of the elements, though, in fact, the *raies ultimes* mostly seem to be either the strongest or among the strongest lines, and they are usually lines which readily reverse. They bear some sort of relationship to the "long" lines employed by Sir Norman Lockyer some forty years ago as criteria to establish the presence of less spectroscopically conspicuous elements in the sun. The paper contains interesting suggestions regarding the energy distribution in line spectra and on the relationship between the *raies ultimes* and the point of maximum radiation.

EARLY NAUTICAL ASTRONOMY.—An address on the beginnings of geographical science, delivered by Sir Clements R. Markham before the Royal Geographical Society on June 10 last (*Geographical Journal*, vol. xlvi., No. 3, September, 1915), contains much extremely interesting information regarding the development of astronomical methods, instruments and tables, employed in navigation during the period of revival of nautical adventure; the period of the first Transatlantic voyage, and the rounding of the Cape of Good Hope. It was, in fact, the efforts of the Portuguese to open up the western coast of Africa, leading seamen into southern waters out of sight of the familiar Polaris, that necessitated the formulation of new methods. A mathematical Junta appointed by King João II. of Portugal (1481–95) triumphed over the difficulties. It now appears that a Jewish royal physician was the leading spirit of the commission, and it was a friend of his, Abraham Zacuto, professor of astronomy at Salamanca, who had ready at hand the requisite tables giving the sun's declination. Lack of space forbids further description here. The lecturer drew largely on the researches of Senhor Joaquim Bensaude, in particular on the latter's work "L'Astronomie nautique au Portugal à l'époque des grandes découvertes," Bern, 1912.

APPROXIMATE DETERMINATION OF PLANETARY LONGITUDE.—In *Knowledge* (August) Prof. Herbert Chatley gives a simplified method of calculating planetary longitudes for elliptic orbits without employing intricate mathematics. The method depends on the assumption, apparently very nearly true, that the difference between uniform circular motion and elliptic is harmonic. It is claimed that the method is capable of giving results to within a few minutes of arc.

THE CANADIAN ARCTIC EXPEDITION.

MR. VILJALMUR STEFANSSON, the Canadian Arctic explorer, whose unexpected safety is announced, contributes his personal narrative of the expedition to Monday's *Daily Chronicle*. He left Alaska in July, 1913, for the Beaufort Sea. Bases were also to be established on Prince Albert Sound and Patrick Island. Mr. Stefansson was accompanied by Dr. Forbes Mackay and Mr. James Murray, of Shackleton's first Antarctic expedition; M. Henri Beuchat, a French anthropologist, who was to study the Eskimo of Bank Land; Mr. W. L. McKinlay and others. Captain Bartlett, of Peary's North Pole expedition, was in charge of the *Karluk, the main ship of the* expedition. Whether or not the *Karluk* could reach Patrick Island and penetrate the Beaufort Sea depended on the prevailing winds. With a persistence of easterlies, which Stefansson hoped for, this would be possible, but otherwise he realised that his plans must be modified.

Early in August, 1913, the *Karluk* was beset in the ice in 147° W., fifteen miles off the shore. In the belief that the ship was firmly frozen in, Stefansson, with three companions, went ashore to hunt towards the end of September. During their absence a strong north-easterly gale broke up the ice and carried the ship away to the west. Passing near the coast firmly beset in the ice the *Karluk* was carried north-westward to 73° N. 162° W. on November 11. Her drift then changed to south-west, and by the end of the year she was sixty miles north-east of Herald Island. Two weeks later the ship was crushed and sank, but not before a quantity of stores had been placed on the ice. Herald Island could not be approached on account of open water, so tracks were made successfully for Wrangell Island. A party of eight, however, including Dr. Mackay, Mr. Murray, and M. Beuchat, who had left the *Karluk* earlier in an attempt to reach

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Herald Island, failed to turn up. Captain Bartlett crossed Long Sound and with great difficulty reached the Alaskan coast, which he followed eastward to Emma Harbour, whence a whaler took him to St. Michael. From there a relief ship set out to Wrangell Island and brought back the remaining survivors of the *Karluk*. Three of the party had died on the island, and later search failed to reveal any trace of Dr. Mackay and his party, all of whom probably perished by falling through the ice.

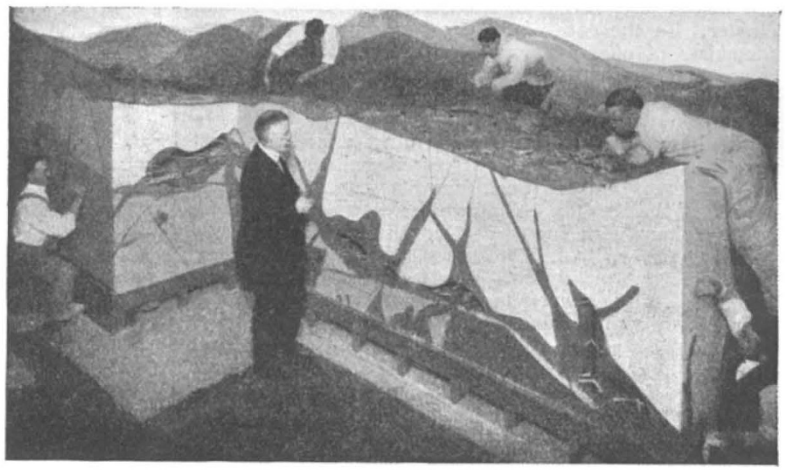
Meanwhile Stefansson had attempted to retrieve the fortunes of the expedition. After a winter in the Mackenzie delta (1913–14), he set out northward over the ice with seven companions, starting from Martin Point, 140° W., on March 22, 1914. Three weeks later the supporting party turned back, bringing news that Stefansson meant to continue northward for at least another fifteen days. A small vessel, the *Polar Bear*, searched for them along the coast of Banks Land last year, but found no trace, and it was generally supposed that Stefansson and his party had perished until the news came last week. Travelling over the ice, and often drifting with it, the party reached 73° N., 140° W. Stefansson then decided to turn eastward, and ninety days after leaving Cape Martin landed on Banks Island, thirty miles south of Cape Alfred. From there he went south to Cape Kellat and met his supply ship. In the winter a four-hundred mile sledge journey to Victoria Island failed to reveal Eskimo. In February this year Stefansson, with three companions, set out northward *viâ* Cape Alfred to Patrick Island, and up its eastern side to Cape McClintock. To the north-east they discovered an extensive new land rising to a height of 2000 ft. The return journey was along the west coast of Melville Island, across McClure Strait, to the Bay of Mercy, and thence across Banks Island to Cape Kellat. From there Stefansson reached Herschell Island in the *Polar Bear*. Throughout his travels he lived chiefly on caribou, bears and seals, and suffered no want. He has since returned to Banks Island, and next year intends to explore his new land, and to make a journey over the Beaufort Sea. Surveys were made of the lands visited, and the work of Sir Robert McClure amplified and extended. R. N. R. B.

THE STANDARDS AND FUNCTIONS OF MUSEUMS.

OUR forefathers regarded museums simply as storehouses for freakish, reminiscent, or merely curious objects, and as the place in which to deposit the various oddments presented by travellers abroad. There was no "purpose" in the display of the objects exhibited, other than that of perchance amusing stray visitors. So far as this country is concerned, the new era of museum management began with the foundation of the British Museum at Bloomsbury, when the first attempt was made to eliminate the purely "showman" element and substitute meaning and purpose in the arrangement of its contents. As compared with the Continental museums, it stands easily first in the character of its endeavours to interest, as well as instruct, the public. But in this we have serious rivals in the museums of the United States, as may be gathered from the forty-sixth annual report of the American Museum of Natural History. In this, and other similar institutions in America, huge sums are spent on large groups of mammals and birds mounted to reproduce the exact environment in which such animals lived. And this illusion is further heightened by skilfully painted backgrounds, executed by artists who accompany the collectors in order that they may reproduce the actual environment in which the specimens lived. This, however, is but an extension of the methods of exhibition introduced by the British Museum many years ago.

In exhibitions designed primarily to instruct rather than to amuse, it is an open question whether our rivals are not over-reaching their ideals—at any rate, in so far as the work of a natural history museum is concerned. Mineralogy, for example, no doubt must find a place here, but large models of a copper mine, such as that reproduced here, and the method of raising ore, would seem to have a more appropriate place in a museum of technology.

The students' collections of such museums must either be of insignificant proportions, or the staff must be much larger than that attached to museums in Great Britain, otherwise the curatorial work in connection therewith would make it impossible for the staff to devote so large a portion of their time to work which is done, indifferently well, it is true, in this country, under the auspices of the Board of Education, as "Nature-study." That this should be so is unfortunate, for, as a means of awakening the intelligence and powers of observation, there is no more efficient aid than the study of natural history, using this term in its widest sense.



Copper Queen Mine Model, Department of Geology and Invertebrate Palæontology. The American Museum of Natural History.

In addition to lectures to children and teachers, special rooms are set apart in American museums for children's collections, while this work is supplemented by travelling museums sent round from school to school by means of motor-vans. Something of this kind could well be imitated in this country.

The department of public health in the American Museum of Natural History answers to no more than one aspect of the department of economic zoology of the British Museum of Natural History—that which concerns the organisms injurious to man—for no attempt seems to have been made to bring together a collection of domesticated animals. On the other hand, our rivals are ahead of us in having instituted