

first three members appear in the second order spectrum, a comparison with the hydrogen line $\lambda 1215.68$ and with the three following lines of the same series is therefore possible, with the result that the wave-lengths are probably correct to one or two tenths of a unit.

The spacing of these four helium lines on the frequency scale is of great interest and importance, for it is found to be identical with the spacing of the first four lines in the singlet principal series. It may be stated, therefore, with considerable certainty that the line $\lambda 584$ forms the first member of a principal series, which, according to the notation of Prof. Fowler, is to be represented by $oS-mP$.

Besides this series there is a single line at 600.5 ± 0.3 of a feeble and diffuse character; its origin is not entirely above suspicion. In the extreme ultraviolet the arc spectrum of helium appears to contain no lines in addition to those just mentioned.

The relation between the accepted values of the resonance and ionisation potentials in helium and the wave-lengths of these new lines is rather puzzling. The ionisation potential should certainly correspond to the limit of the $oS-mP$ series; now this limit can be accurately calculated, it corresponds to 24.5 volts, but the experimental value is 25.3 volts. This is the chief difficulty, but it is not the only one, for the agreement between the wave-lengths of the individual spectrum lines and the values of the resonance potentials as determined by Franck and Knipping is not satisfactory. A correction of about -0.8 volt, if applied to all the potential measurements, will bring the two sets of data into fair agreement, but at the expense of the first resonance potential which is left without any corresponding line in the spectrum.

The matter should be of some interest to those who are struggling with the model of the helium atom.

THEODORE LYMAN.

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August 3.

Transcription of Russian Names.

WITH regard to the recent correspondence in NATURE on the transcription of Russian names, may I direct attention to the fact that the Russian Academy of Sciences adopted a system of transliteration many years ago, and a note by Prof. J. W. Gregory giving the new rules appeared in NATURE on May 14, 1908, p. 42. In all the publications of the Academy the Latin transcription of Russian names is given in accordance with this system.

Since, in the event of Russia adopting the Latin alphabet, the Academy of Sciences, as the highest authority of the country, will be called upon to formulate the rules, I think it would be advisable for all countries to conform to the rules already set forth by this Institution.

It is needless to say that at present Russian transcription is in a very confused state, the name of the same author being frequently given in different ways (e.g. Cholodkovsky = Kholodkovsky; Ivanov = Iwanow = Iwanoff).

CECIL A. HOARE.

Wellcome Bureau of Scientific Research, N.W.1,
July 25.

Sense of Smell in Birds.

THE observations with regard to the olfactory sense of vultures recounted by Mr. C. B. Williams (NATURE, July 29, p. 149) are at variance with those of hunters and field naturalists and the experiments of Audubon, Bachman, and Darwin (see Darwin's "Journal of Researches, Voyage of H.M.S. *Beagle*"). From *a priori*

reasons it could be argued that birds as a whole depend mainly on sight, and no one would be inclined to deny an obvious fact when it is emphasised by morphological modification. Ducks and geese and other birds which feed for long periods on land and marsh certainly have good powers of smell, but in the majority the sense is feebly or not at all exercised. The conclusions of Mr. Abel Chapman, given on pages 241 and 423 of his "Savage Sudan" (1921), that with few exceptions birds and certainly that eagles and vultures possess no sense of smell, deserve attention, for he is a wildfowler with a long experience. He has told me, among many interesting observations which prove the fact, that in the Sudan, when it is necessary to preserve meat from a carcass for mess purposes, all that is necessary is to remove it a short distance and cover it with branches. The vultures discover without delay the carcass and pick it clean, but fail to find the rich supply of meat so near them. The fact appears, therefore, to be that vultures use their telescopic eyes not merely to watch what is taking place over a wide range below them, but to note what their neighbours are doing. If one disappears, the rest in turn fly to the region to find out the cause.

ALEXANDER MEEK.

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A Coincidence in Values.

IT is to be noted that if the simple multiple "seven" of the atomic heat (6.4) be taken a magnitude is obtained double that of the gram-molecular volume for the ideal gas (22.412 litres). On such a basis of reckoning the "ideal atomic heat" would be expressed by deduction from the ideal gas as 6.403.

Dulong and Petit's law would thus be stated: "The product of the atomic weight and the specific heat of an element in the solid state is constant, and for the ideal solid is exactly $\frac{2}{3}$ ths of the gram-molecular volume for the ideal gas."

A linkage exists between the liquid and gaseous states through the gas constants. Although the solid state has not in any great measure adapted itself to what Van't Hoff termed mechanical concepts, we can foresee the existence of a simple connecting link between all the three states of matter. The cynic, of course, will observe that much virtue doth abide in the magic number seven!

L. M. STEWART.

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The Evolution of Consciousness.

YOUR reviewer, in a kindly notice of my book in NATURE of July 29, p. 147, sums up its general attitude in these words: "All that is, Mr. Tilby tells us, has emerged in a definite historical sequence, and we have merely to accept the fact and not ask why." May I point out that I did not say this, and I do not think it? Indeed, it conflicts rather glaringly with the thought I tried to express.

Certainly we have to accept the facts of the universe in their historical sequence; but we have to do something more than accept them—we have first to discover them before we can accept them. And of the major portion of those facts we are still unaware, as the fundamental contradictions of contemporary philosophers abundantly testify.

But to suggest that we are "not to ask why" is to commit treason against the intelligence. That lazy heresy was once popular in the circles of pious orthodoxy, and it has occasionally infected the more epicurean or more pessimistic type of agnostic. But this merely negative attitude will never satisfy. It is very largely because man has asked why that he