part of the β-radiation very strongly, it reduces the intensity of the component, which is not deflected by nearly one-half. The results obtained are not sufficiently accurate to determine the absorption coefficient of this radiation, but they appear to confirm very definitely that it is to be considered a β-radiation.

The probable existence of a hard component of the β-radiation of potassium has been recently put forward by Behouneck as the result of his researches on the γ-radiation of this element. The results above seem to confirm his suggestion.

I wish to express my warmest acknowledgments to Prof. Rossi, who has afforded me valuable assistance and advice in my experiments.

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[1] G. Occhialini, *Rend. Lincei.* In the press.

The Atomic Weight of Fluorine.

THERE is a good deal of evidence from chemical sources that the atomic weight of fluorine is greater than 19·00. In recent years the ratio of sodium fluoride to sodium chloride has been determined by McAdam and Smith,[1] who find the value 19·009. In addition, from the limiting density of silicon fluoride, Germann and Booth [2] find the value 19·010, assuming that the atomic weight of silicon is 28·06. The only work which supports the value 19·00 is that of Moles and Batuecas [3] on the limiting density of methyl fluoride. Since methyl fluoride is a difficult gas to prepare in a state of purity by the method employed by Moles, and since, moreover, his density determinations show divergences far in excess of the experimental error, we have recently carried out a redetermination of the limiting density, using the same microbalance method as that employed for xenon.[4]

Methyl fluoride was prepared by Collie's method, that is, the action of heat on tetramethyl ammonium fluoride, and after purification with potash was liquefied and fractionally distilled several times until no alteration in density could be detected on further fractionation. The balancing pressures of oxygen and methyl fluoride were then compared at two densities giving the mean ratios 1·06726 and 1·06550 for pressures of oxygen of 335·61 mm. and 156·86 mm. respectively at 21° C. On extrapolation to zero pressure the limiting ratio is found to be 1·06395, corresponding to a molecular weight of 34·046. If now we assume for the atomic weight of carbon 12·010, a value which we obtained a few weeks ago from the limiting density of highly purified ethylene, we get for the atomic weight of fluorine 19·013. It may be noted that any probable alteration in the atomic weight of carbon would make that of fluorine higher.

From our results, the compressibility coefficient $1 + \lambda$ of methyl fluoride at 21° C. is 1·00823. We can calculate the corresponding value of $1 + \lambda$ at 0° C. with a very fair degree of approximation by assuming a slightly higher coefficient of thermal expansion than that of carbon dioxide, which is well known. Such a calculation carried out on our results for ethylene gives a compressibility coefficient in excellent agreement with the accepted value. For methyl fluoride, on the other hand, we find a value 1·0109 at 0° C., in complete disagreement with the value found by Moles, namely, 1·0180, but in general accordance with those for gases of similar critical constants. It may be remarked that, even if we assume that methyl fluoride has as large a coefficient of expansion as sulphur dioxide, it would be impossible to bring our coefficient higher than 1·012. In view of the fact that the critical temperatures and pressures of carbon dioxide and methyl fluoride are 31° C. and 45° C. and 73 atmos. and 62 atmos. respectively, whilst those of sulphur dioxide are 158° C. and 78 atmos., there can be little error in the compressibility coefficient which we have calculated at 0° C. Moreover, if we calculate the coefficient of thermal expansion of methyl fluoride from Moles's value for the normal density and our value for the density at 21° C., we get the highly improbable value of 0·0042. We may say that a similar calculation applied to ethylene gives the value 0·00369 for the coefficient of expansion. We must therefore conclude that Moles's values for both the density and compressibility coefficient are far too high, though by a partial compensation of errors they lead to an atomic weight of fluorine in accordance with mass spectrograph measurements. It seems likely that Moles's gas was contaminated with a few per cent of methyl ether, an impurity which he himself recognises as being possible, but which cannot occur in our method of preparation.

There seems to us, therefore, to be strong evidence that the atomic weight of fluorine lies in the neighbourhood of 19·010 rather than of 19·000. This would appear to indicate the presence in small quantities of a higher isotope.

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[1] Carnegie Institution Report, No. 267, p. 47; 1918.
[2] *Jour. Phys. Chem.*, vol. 21, p. 81; 1917.
[3] *Jour. Chim. Phys.*, vol. 18, p. 353; 1920.
[4] NATURE, vol. 127, p. 970; 1931.

Acromegaly in the Far North.

THE question raised by Prof. Seligman [1] tempts me to proffer some speculations which I have for some time entertained. They are drawn from the field of experimental zoology, and would not merit consideration if it were not for the circumstance that they are capable of being tested experimentally. The determination of seasonal changes in animals is closely akin to the question which Prof. Seligman propounds. I suggest that inquiry directed to elucidate the significance of the pituitary gland to functional changes which exhibit a seasonal periodicity might provide the answer. The following circumstances suggest that there may exist a close relationship between pituitary secretion and seasonal states.

(1) It is now known that the co-ordination of amphibian colour change is determined by the reflex secretion of the pituitary gland. The effective stimuli are light, temperature, and humidity—the three chief agencies through which seasonal influences presumably act upon the animal body. In addition to a hormone secreted by the pars intermedia, a second hormone secreted by the pars tuberalis of the gland now seems to be involved (Hogben and Slome, 1931) in amphibian colour change.

(2) Work in my laboratory at Cape Town recorded in a paper now in the press (Hogben, Charles, and Slome) shows that removal of the pituitary in amphibia brings about drastic retrogression of the ovaries, while injection of anterior lobe extracts produces ovulation. Thus the pituitary has the same functional relationship to the ovaries in amphibia and mammals. It was further found that perceptible retrogression of the ovaries occurs in eyeless animals. Taken in conjunction with the fact that continuous illumination stimulates egg production in fowls, there is some encouragement for the supposition that the reflex stimulation of the pituitary by light is not restricted to the secretion of the hormone or hormones which