In one respect only do the X-ray photographs of the needle crystals appreciably differ from those of the original rhombohedra. They all show a much more marked diffuse ring with a spacing of about 4·5 A., a value we have come to consider characteristic of the presence of 'amorphous' proteins[6]. Here it may be due to imperfections of the crystal following perhaps partial breakdown. But amorphous proteins such as gelatin are known to have a marked effect on the habit of both organic and inorganic crystals; and it seems possible that a similar influence appears here, amorphous insulin or a breakdown product being included in the crystals and being itself responsible for the adoption of the prismatic form.

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Absolute Configuration of the Naturally Occurring α Amino-Acids

THANKS largely to the extensive researches of Levene and his collaborators, it now appears to be well established that, as suggested by Clough in 1918[1], the naturally occurring α amino-acids all possess the same configuration. Until recently, the absolute configuration was not known for any optically active compound, but in the course of a theoretical calculation of rotatory power, Boys[2] deduced a rule giving the absolute configuration of any enantiomorph from the sense of its rotation—namely, "that a dextro compound has the configuration such that, when the largest group is nearest to the hypothetical observer the other groups in order of diminishing size appear in a clockwise rotation".

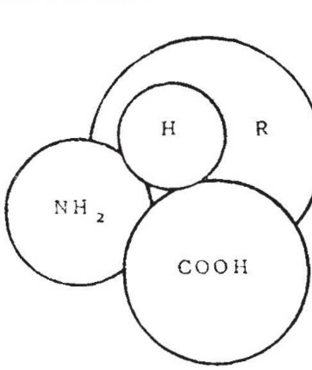

Fig. 1.

Boys's rule, which appears to have been accepted by Levene and Lowry, can only be applied with certainty in the absence of interactions of the solvent with the solute molecule, a condition which is far from being fulfilled by the amino-acids; marked solvent action is indicated in several cases by a complete change of sign of the rotation with temperature or with *p*H. The configurations of the amino-acids have, however, been correlated with those of other compounds in which solvent action is less; from the recent paper of Levene and Mardashew[3], the naturally occurring amino-acids have the configuration of lævo-rotatory 2-amino-hexane, a compound to which Boys's rule may be applied with more confidence.

If the validity of the rule and its applicability to this amine be accepted, then the naturally occurring α amino-acids, which amount to more than 95 per cent of most proteins, can be assigned the absolute configuration given in Fig. 1.

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Use of Krypton-filled Ionization Chambers for Cosmic Ray Measurements

SOME years ago, compressed air and nitrogen were replaced by argon in cosmic ray ionization apparatus[1], argon being approximately twice as effective as nitrogen, which in turn is more effective than air.

Krypton is now used for filling special incandescent electric lamps, and is thus more easily available than hitherto. It was *a priori* probable that this gas of high atomic number would give much more favourable results than argon. The Gesellschaft für Lindes Eismaschinen, Germany, has kindly supplied me with compressed gas containing 94·5 per cent krypton and 5·5 per cent xenon. An ionization chamber was filled with the gas under a pressure of 12 atm. Only a few measurements could be carried out with the apparatus, as in consequence of an accident the greater part of the gas was lost. Nevertheless, the results obtained seem to be of interest to workers in that domain of science.

I had at my disposal two almost identical ionization chambers which were alternately filled with dry air under atmospheric pressure and with compressed krypton, argon or nitrogen. The chambers were of steel 5 mm. thick, had a volume of about 900 $cm.^3$ each and their central electrodes were connected with Lindemann electrometers; they were exposed to the γ-rays from 0·4 mgm. radium at a distance of 120 cm.

Denoting by I_{air} the ionization in air of normal pressure and temperature, it was found:

$$I_{N_2}^{15\cdot5\text{ atm.}}/I_{\text{air}} = 9\cdot5\,;\quad I_{\text{Ar}}^{15\text{ atm.}}/I_{\text{air}} = 18\cdot9\,;\quad I_{\text{Kr}}^{12\text{ atm.}}/I_{\text{air}} = 40\cdot2.$$

The ionization at these relatively low pressures is roughly proportional to pressure[2]. Reducing all measurements to the same pressure of 12 atm., we obtain the following relative ionization values for nitrogen, argon and krypton: 7·4; 15·1; 40·2. The nitrogen and argon used were of high purity; with commercial products, the superiority of krypton would be still more marked.

The γ-ray and cosmic ray ionization are generally proportional to each other. I undertook some experiments to test it in the case here concerned. My results are too incomplete to be quoted. It has been found, however, that the ionization due to cosmic rays is more than twice as great in krypton as in argon. It is thus obvious that the substitution of argon by krypton in ionization chambers will give a gain even more considerable than that which was