content of the lateral bands of herring and cod would be particularly high; but the gradient observed cannot correspond to cytochrome *c*, which has an isoelectric point of about 10 (Tint and Reiss[8]). It thus appears that we are dealing with myoglobin.

This identification has been confirmed by the use of Theorell's[9] isolation method. Fish myogen and globulin X are removed at 30° C. from the turbid extract previously mentioned by addition of 0·15 vol. of *M*/2 basic lead acetate, and the excess of lead is removed by solid tertiary phosphate, the *p*H being kept throughout between 7 and 8 by suitable addition of *N* sodium hydroxide or *N* acetic acid. The ionic strength is then increased by addition of a saturated neutral ammonium sulphate solution to a value corresponding to 75 per cent saturation. The amount of coloured material removed at this salt concentration is small. Solid ammonium-sulphate is then added up to 95 per cent saturation. The red precipitate obtained is dissolved in water and dialysed against the buffer of ionic strength 0·15 and *p*H 7·3 previously mentioned. Electrophoretic analysis of these preparations reveals the presence of two gradients, the faster coloured one representing about 30 per cent of the total protein concentration. A similar separation is obtained in the ultracentrifuge, the slow-moving peak corresponding to a chromoprotein of a corrected rate of sedimentation of $1 \cdot 7$–$1 \cdot 8 \times 10^{-13}$. A preliminary examination of the visible spectra of these preparations gives three maxima of absorption, one very pronounced at 415 mμ and two much smaller ones at 540 and 575 mμ, in good agreement with the previous determinations of Theorell[10] and others[1] on myoglobin.

Carp myoglobin sediments therefore at approximately the rate of horse, ox and cat myoglobins[11]. Its electrophoretic mobility, however, is very different from that of horse[9] and whale[12] myoglobins and is similar to that of rabbit myoglobin[13], so far as we can judge from the very different experimental conditions used. Its electrophoretic behaviour thus agrees well with the well-known heterogeneity in amino-acid composition of the myoglobins, and its ultracentrifugal behaviour with their apparent similarity in size and shape. From the point of view of comparative biochemistry, it appears also to be widely distributed among fishes, in view of the frequent occurrence of the lateral bands in these primitive vertebrates[4].

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Structure of the Nucleic Acids

We have formulated a structure for the nucleic acids which is compatible with the main features of the X-ray diagram and with the general principles of molecular structure, and which accounts satisfactorily for some of the chemical properties of the substances. The structure involves three intertwined helical polynucleotide chains. Each chain, which is formed by phosphate di-ester groups and linking β-D-ribofuranose or β-D-deoxyribofuranose residues with 3′, 5′ linkages, has approximately twenty-four nucleotide residues in seven turns of the helix. The helixes have the sense of a right-handed screw. The phosphate groups are closely packed about the axis of the molecule, with the pentose residues surrounding them, and the purine and pyrimidine groups projecting radially, their planes being approximately perpendicular to the molecular axis. The operation that converts one residue to the next residue in the polynucleotide chain is rotation by about 105° and translation by 3·4 A.

A detailed description of the structure is appearing in the February 1953 issue of the *Proceedings of the National Academy of Sciences of the United States of America*.

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Non-specific Precipitation of Proteins by Polyhaptenic Dyes

The proteins bovine γ-globulin and human serum albumin were found to give precipitates with the polyhaptenic dyes, 2-methyl-4,6-di(*p*-azobenzenearsonic acid) phenol (III), and 1,3-dihydroxy-2,4,6-tri(*p*-azobenzenearsonic acid) benzene (VI)[1], from *p*H 3·72 to *p*H 0·2–0·3 above the isoelectric points of the proteins, and in sodium acetate – acetic acid buffer of ionic strength either 0·20 or 0·10. Either 0·5 or 1·0 ml. protein solution was added to 0·5 or 1·0 ml. of each of a series of serially diluted dye solutions of initial concentrations of 0·57 (III) and 0·80 per cent (VI), the serial dilutions being made with buffer of the same *p*H and ionic strength as the protein solution.

In general, the amount of protein precipitated in each experiment increased to a maximum in the second or third—occasionally the fourth or fifth—of the eight tubes in the serial dilution. This suggests that the precipitation is due to the formation of a framework, as in the case of serological precipitation, particularly those in which the precipitating antigen is a simple substance[1].

On the assumptions that at *p*H 5·5–5·7 the dyes combine with the proteins as monomeric molecules, and that the haptenic groups interact with separate combining groups of the proteins, the number of combining groups per γ-globulin is calculated to be 44 for compound III and 36 for compound VI. Similarly, a value of 22 was estimated for albumin with compound III.

Further, it was found that at *p*H values from 5·0 to 5·4 at which neither compounds III nor VI produces a precipitate with albumin, the presence of albumin dramatically decreases the amount of pre-