

their collaborators have measured methyl and ethyl cellulose and have found values of 14,000–38,100 and 125,000 respectively.

Concerning the shape of proteins, data and formulae presented by J. W. Mehl, J. L. Oncley and R. Simha^{4,5} give better agreement between results obtained by viscosity measurements and those provided by the ultracentrifuge than that shown in Table I.

Finally, we owe to Dr. Kraemer the information that the viscosity behaviour of gelatin at 34° investigated by Sanigar, Krejci, and Kraemer⁶ is irreconcilable with the sedimentation constants, if the gelatin particles are assumed to be solvated spheres. The necessary degree of solvation would practically eliminate the difference between the densities of particle and medium.

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215 Fourth Avenue,
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¹ NATURE, 145, 571 (1940).

² Kraemer, E. O., *Ind. Eng. Chem.*, 30, 1200 (1938).

³ Signer, R., and Tavel, P. v., *Helv. chim. Acta*, 21, 535 (1938). Comp. also Signer, R., and Liechti, J., *Helv. chim. Acta*, 21, 530 (1938), and the data given in Svedberg and Pedersen's "The Ultracentrifuge" (Oxford, 1940), pages 416 and 431.

⁴ Simha, R., *J. Phys. Chem.*, 44, 25 (1940).

⁵ Mehl, J. W., Oncley, J. L., and Simha, R., *Science* (in the press).

⁶ Sanigar, E. B., Krejci, L. E., and Kraemer, E. O., *J. Amer. Chem. Soc.*, 60, 757 (1938).

Camouflage in War-time

THE article on camouflage in NATURE of June 22 provides ample evidence of incompetence in this subject, but the writer has turned his guns in the wrong direction. His attack on artists has little relation to fact, in that the vast mass of 'camouflage' visible in all its glorious futility on army vehicles and buildings is not the work of artists.

A few weeks after the declaration of war a fellow artist, Mr. F. S. Manner, and I submitted a memorandum to the War Office camouflage authorities which covered all the criticisms mentioned in the article and a great many more. We are aware of at least one other memorandum on similar lines also submitted by an artist. We stressed the importance of biological study which, I am afraid, we called "Nature study", while pointing out the many occasions when it would be quite inapplicable. We also gave what we consider a practical solution to the whole question of co-ordination and control.

We also approached a Government contractor in relation to structural camouflage, and after some inquiry, he informed us that much of the work was in the hands of the Paint Manufacturers' Association. If this is so, it may be one of the reasons why khaki and green lozenges, of equal tone value, appear like a rash on everything that moves or stays in the military field. The artists at the Camouflage Research Station are probably equally sceptical about the situation, but what artist since the dawn of time has not obeyed the voice of the Philistine or said good-bye to his wage packet? There is a strong case for employing display and exhibition artists rather than those accustomed to landscape and other forms of painting, because the former are used to designing structurally, and experts in getting almost any effect with the minimum material.

The artist should not be blamed for the present situation, however, because he is only too willing to co-operate with the biologist; indeed he is no mean naturalist himself. Leonardo da Vinci, a great artist and scientist, pointed out Nature's use of protective colouring before Thayer was born. Artists before and since have been fully aware of the principles of 'countershading', 'coincident pattern', 'disruption', and 'deflection', only they have been called in art schools since the time of Rembrandt such other names as 'counterchange', 'discord and harmony', 'atmospheric and solid perspective'. Indeed, it is impossible to paint a picture without using these principles. Incidentally, no mention is made of the importance of aerial photography, which by using special film nullifies the virtue of colour, whether put on by naturalist or artist.

Let men of science turn their righteous indignation (an emotion impossible to the twisted cynicism of the artist) in the direction of the bureaucrats responsible for the control of camouflage. They will find the artists dour warriors in the same cause.

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Cobalt and Pine Disease

IN a recent communication Stewart and Ponsford have questioned the justification for our claim regarding the value of cobalt in the control of pine disease in sheep. We have examined the results which they have published², but find no evidence that they effect the validity of our conclusions.

It is unnecessary to go into details here, for a summary of the work carried out on the Scottish side of the border appeared last year³ and shows that the use of cobalt for curative and preventive purposes has been widely adopted in the south of Scotland and in other areas with highly successful results. On farms where the treatment has been introduced on a systematic scale pine disease has been abolished. We have treated more than three hundred pining sheep by oral administration of cobalt on many different farms and the rate of recovery has been 97 per cent. The same treatment has been given by stock owners on the farms concerned with similar results. Sheep to which cobalt chloride has been administered have been kept for two years on pining land without a change of pasture and have remained entirely healthy.

Whatever may be the cause of this disease known as 'pining' on the Scottish borders, there now seems to be ample evidence that small doses of cobalt can cure or prevent it. It is possible that the experiments carried out by Stewart and Ponsford in Northumberland have been conducted under conditions which have become abnormal and have led to complications so that the use of cobalt alone is unavailing.

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¹ NATURE, 145, 1023 (1940).

² *Vet. Rec.*, 52, 379 (1940).

³ *Agric. Prog.* 16 181 (1939).