Summary

In this mainly expository paper, constitutive equations based on the network models of Yamamoto, Lodge, and Kaye are re-derived in a common notation involving the use of base vectors embedded in the deforming macroscopic continuum. The derivations are thereby simplified in some respects and the differences of detail between the models are clarified. In Lodge's theory, the sub-network superposition assumption is replaced by alternative assumptions concerning the creation and loss of network segments, and the theory is extended to non-Gaussian networks. Kaye's theory is extended to allow for the presence of entanglement junctions of different complexities.

References

3) Green, M. S. and A. V. Tobolsky, ibid. 14, 80 (1946).

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Rheological Research, Teaching and Applications
Rheologische Forschung, Lehre und Anwendung

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A Survey of British Rheological Research

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With 4 figures

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with which the work is concerned, and the methods of approach that are applied to a problem.

2. Contributors to the Survey

Questionnaires were sent out to every research laboratory thought to be involved in rheological research, as well as to about a thousand individual rheologists. A high proportion of these were returned, and it is believed that only a small fraction of the work eligible has not been reported, so that the survey may be regarded as reasonably complete.

The total of 411 establishments contributing information is made up as follows:

- University departments: 170
- Other college laboratories: 46
- British government bodies: 22
- Hospitals and medical establishments: 20
- Co-operative research associations: 24
- Nationalized industries: 10
- Private firms: 115
- Consultants: 4

A number of indexes are appended to the report, including an index to the 411 contributing establishments and an index to the 748 research workers mentioned by name in the report.

3. Analysis of Information Reported

Two further indexes have been compiled to enable information in the report to be located quickly.

One of these is an index to fields of interest. With this it is possible to see, for example, which university departments are concerned with extrusion, or which industrial laboratories are concerned with theoretical rheology, and so on.

The other is an index of materials. It names 214 materials, beginning with adhesives (with which 6 laboratories are working) and alumina (1 laboratory), and taking in blood plasma (27 laboratories), concrete (13 laboratories), eyes (1 laboratory), glaciers (1 laboratory), lubricants (6 laboratories), nickel and its alloys (7 laboratories), nitrogen (2 laboratories), paint (11 laboratories), polyethylene (6 laboratories), sand (6 laboratories), and sewage sludge (3 laboratories), until