

findings. The extremely small size of the chromosomes in most members of the Ulotrichales is probably the reason for the lack of any extensive cytological work on the group.

The materials indicated by an asterisk in the above list were obtained from the Cambridge Culture Collection of Algae and Protozoa. The materials of *M. amoena* and *U. zonata* were collected from Wise Een Tarn and Lake Windermere respectively. Detailed accounts of mitosis in the above forms will be published elsewhere.

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A Non-Destructive Method of detecting Diseases in Wood

ULTRASONIC equipment has been used by the Timber Development Association for detecting flaws in wood, and its possible development for determining the presence of diseased tissues has been suggested¹. The principle of this type of flaw detection is to generate pressure (sound) waves of very high frequency which are transmitted through suspect materials such as metals or plastics. When flaws are present, the reduction of the degree of transmission in the defective area can be measured. Ultrasonic waves produced by commercial flaw detectors do not harm the materials being tested. The equipment is portable.

In these trials transmission of ultrasonic energy through wood was measured both down and across the grain. After two areas, on exactly opposite sides of the samples, had been smoothed to give two flat surfaces, each about 25 sq. cm. in area, the wood was smeared with a coupling agent to ensure good contact between the probes and the wood. To

transmit across the grain the sampling areas had to be stripped of bark, which was found to be impenetrable to the ultrasonic energies employed.

The transmission of ultrasonic energy through wood is considerably reduced even when slight defects are present (Table 1). The sensitivity could probably be increased with sets specially adapted for detecting flaws in timber. No transmission could be obtained through 5 cm. of red pine infected with dry rot even though ultrasonic energy could be transmitted through 130 cm. of sound seasoned beech.

Besides its potential value as a research tool for studying the ecology of tree disease organisms, the most important development of this technique would be the reduction of economic losses of timber. Trees of value are often lost because fungal infections (such as heart and butt rots) remain undetected for many years. The early detection of disease in a plantation would enable a decision to be made about its potential value and future management. Loss on imports or timber in storage could be reduced if a speedy method of detecting incipient decay in bulk timber were available.

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¹ *Agric.*, **63**, 294 (1956).

Eels in Southern Africa

SPONSORED by the South African Council for Industrial and Scientific Research, this Department, under the direction of Prof. J. L. B. Smith, is undertaking the study of the life-history of the freshwater eels of the western Indian Ocean. Most authorities have hitherto held that only one species of freshwater eel, namely, *Anguilla mossambica* Peters, occurs in South Africa. Ege¹ recorded a specimen of *Anguilla*

Table 1. RELATIVE TRANSMISSION OF ULTRASONIC ENERGY THROUGH SAMPLES OF WOOD

Direction of transmission	Flaw detector	Frequency (mega-cycles)	Transducer	Coupling agent	Percentage transmission through sound wood*					
					Birch†			Oak†		
					Sound wood	Wood infected by <i>Polyporus betulinus</i>		Sound wood	Sound wood with hole 1/4 in. diameter drilled longitudinally	Brittle wood with pockets of rot
Central rot 32 per cent by vol.	Completely rotten									
Across grain	Kelvin Hughes Mark V	1/2	Quartz	'Polycel'	100	0	0	—	—	—
	Kelvin Hughes Mark V	1/2	Barium titanate‡	'Vaseline'	100	20	0	100	10	50
	Kraut Kramer Mark IX	1/2	Barium titanate‡	'Polycel'	100	17-33	0	100	3-23	12-27
Down grain	Kelvin Hughes Mark V	1/2	Quartz	'Polycel'	100	38	0	—	—	—
	Kelvin Hughes Mark V	1/2	Barium titanate‡	'Vaseline'	100	10	0	100	—	15
	Kraut Kramer Mark IX	1/2	Barium titanate‡	'Polycel'	—	—	—	100	—	55

* Absolute values are not shown as machines were not calibrated and scale values recorded were peculiar to each machine, so values obtained by the individual machines are not comparable.
 † Dimensions of samples were approximately 9 cm. wide by 20 cm. long. Samples were obtained from standing trees five days before testing and were preserved by smearing 'Vaseline' on all cut surfaces, then sealed into polythene bags.
 ‡ Machine not tuned, so efficiency was about 5 per cent.