

The Mechanics of Solidity.

THE subjoined table appears to indicate that the mechanical "hardness" of a solid is fairly closely related to its thermal expansion coefficient. There are exceptions like "invar," and for various reasons attention should be directed more to the scope of the relationship than to particular discordances between the hardness figures.

Comparison between Mean Linear Expansion and Three Scales of "Hardness."

Material	Thermal expansion coefficient $\times 10^6$	Hardness		
		Moh's scale	Auerbach's "absolute" scale	Brinell scale
Diamond ...	1.1	10.0	2500	
Topaz ...	7.0	8.0	525	
Beryl ...	5.0	7.8		
Arsenic ...	5.6	3.5		
Tourmaline ...	7.3	7.3		
Garnet ...	8.5	7.0		
Common glass	7.1	6.5	300	
" "	8.8	4.5	200	
Iridium ...	7.0	6.0		217.0
Silicon ...	7.6			240.0
Rhodium ...	8.5			156.0
Platinum ...	9.0	4.3		44.0
Antimony ...	11.5	3.3		58.0
Marble ...	11.7	3.0		
" "		4.0		
Palladium ...	11.8			61.0
Iron ...	12.1	4.0	280	97.0
" "		5.0		
Cobalt ...	12.4			86.0
Nickel ...	12.8			144.0
Bismuth ...	13.5	2.5		14.0
Gold ...	14.4	2.5	97	33.0
" "		3.0		
Tellurium ...	16.7			27.0
Copper ...	16.8	2.5	95	53.0
" "		3.0	143	
Silver ...	19.3	2.5	91	37.0
" "		3.0		
Zinc ...	21.0			45.5
Tin ...	22.3	1.5	11	15.6
Aluminium ...	23.1	2.0	52	24.7
Magnesium ...	26.9			38.3
Lead ...	29.2	1.5	10	6.9
Thallium ...	30.2			7.3
Cadmium ...	30.7			29.0
Selenium ...	36.8			75.0
Rock salt ...	40.4	2.0	20	
Indium ...	41.7			1.0
Ice ...	52.8			
Sulphur ...	64.1	1.5		
" "		2.5		
Sodium ...	72.0			0.07
Potassium ...	83.0			0.03
Wax ...	00.0	0.2		
Indiarubber ...	200.0			

It may, perhaps, be inferred that engineers would be well advised to scrutinise "solidity" more closely, and to make use of the simple physical constants of a metal as criteria of quality in preference to developing a chaos of complicated tests which bear as little relation to each other as they do to any practical service in which metals are employed.

The Brinell hardness measurements are taken from a paper by Prof. C. A. Edwards (Inst. of Metals, 1918); the others from Landolt-Börnstein's tables.

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12 Edward's Road, Whitley Bay, Northumberland, November 8.

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The Protection of Animal and Bird Life in Australia.

I AM directed by the Hon. the Minister of Industry, who is the Minister controlling the Animal and Bird Protection Act in South Australia, to say that his attention has been directed to a note in NATURE of July 1 last, p. 558, in which the following quotation from a report from Mr. C. M. Hoy, of the Smithsonian Institution, appears: "There are very few game laws in Australia, and no one gives any attention to the ones that are in order." The Minister has communicated with the Smithsonian Institution, expressing regret that Mr. Hoy should have made such a statement, knowing, as he must, that so far as it applies to South Australia it is not correct that "no one gives any attention" to the laws that are in order.

We have an Animal and Bird Protection Act with very wide powers, and every effort is being made to carry out this law. We realise, of course, that in our out-back areas, where the population is very sparse, the law may not always be observed. At the same time, however, a special check is kept on persons dealing in skins and furs, and, generally, we have every reason to believe that the laws relating to the protection of animals and birds are fairly observed.

The very fact that Mr. Hoy was unable to collect a single protected animal or bird, or the nest or eggs of the protected birds, without a permit signed by the Minister of Industry, and that this permit was distinctly limited, inasmuch as it was issued subject to the condition that "no more than four examples of each totally protected species of native animal or bird are to be taken, excepting the common opossum, of which twelve (12) may be taken. No specimen of the Toolach wallaby (*Macrobis Greyi*) is to be taken under any circumstances. Not more than twelve (12) examples of partially protected birds and animals," is ample evidence that Mr. Hoy knows that action is being taken in South Australia to compel the observance of these game laws. The Minister desires me to add that he trusts in the circumstances you will give publicity to his protest against Mr. Hoy's statements.

W. L. SUMMERS,

Secretary, Ministry of Industry.

Adelaide, South Australia, September 21.

New British Oligochæta.

IN revising my material and records of the Lumbriculidæ I find that two new species may now be placed on our list of indigenous annelids. These are *Rhynchelmis limosella*, Hoffm., and *Stylodrilus heringianus*, Clap. Respecting the former Beddard wrote in his "Monograph of the Order Oligochæta" (1895, pp. 215-16): "I have seen a specimen from some part of England, but cannot give any details. There is every probability that it is a native of this country." It reached me some time ago from Ringwood, Hants.

Stylodrilus heringianus was first found near Brougham, in Cumberland, in March, 1911, but, being immature, there was an element of doubt as to its identity. In April, and again in November, of the same year I found it in two different localities near Swadlincote, Derbyshire. Our British list of Lumbriculidæ, therefore, now numbers seven species under four genera. These are *Lumbriculus variegatus*, O. F. M.; *Trichodrilus cantabrigensis*, Bedd.; *Stylodrilus Vejdovskyi*, Benh.; *S. gabretæ*, Vejd.; *S. Hallissy*, Southern; *S. heringianus*, Clap.; and *Rhynchelmis limosella*, Hoffm.

HILDERIC FRIEND.

"Cathay," Solihull.