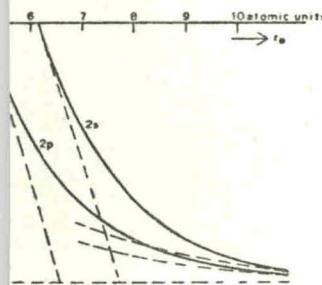


lit up into two adjacent levels, such that than the $2s$ orbit.



curves for the $2s$ - and $2p$ -levels. Dotted lines d the asymptotes of the approximation of § 2. Iso an asymptote for both curves.

unctions. When certain values of the azi-
 $l = 0, 1, 2, \dots$ and of the energy E formula (2); n can eventually be imaginary

TABLE II

1s-level ($N = 1, l = 0$)		
E atomic units	r_0 atomic units	from section
-0.500	∞	3a
-0.4960	5.020	3b
-0.4834	4.068	3b
-0.4417	3.192	3b
-0.3965	2.807	3b
-0.3273	2.472	3b
-0.2323	2.200	3b
-0.2222	2.178	3b
-0.1250	2.000	3a
-0.0800	1.934	3b
-0.0566	1.902	3a
0	1.835	3c
0.0566	1.778	3d
0.125	1.711	3d
0.500	1.448	3d
1.928	1.15 ^a	3f
2.193	1.08 ^a	3f
2.518	1.01	3f
3.427	0.91	3f
4.935	0.81	3f
∞	0	3e

and non-integer) are chosen, the wave function (4), (6) is known as function of r or ρ .

Each time when a zero point of this wave function is found this node can be considered as the radius r_0 of the cage in which the hydrogen atom is compressed. This gives sets of corresponding values of E and r_0 . For $l = 0$ and no nodes between $r = 0$ and $r = r_0$ a point of the 1s-level energy curve is found.

When for $l = 0$ there lies one node between the limiting points of the coordinate r , this is a wave function of a 2s-state. For $l = 1$ and when no zero point occurs, one finds points of the $2p$ -curve, etcetera. The various regions of energy will now be considered and methods described of finding nodes.

a) $E < 0$. When n is an integer, the wave function degenerates into a derivative of a Laguerre polynomial, with a number of

TABLE III

The 2s-level ($N = 2, l = 0$)			
n	E atomic units	r_0 atomic units	from section
2	-0.1250	∞	3a
2.072	-0.1165	10.36	3b
2.213	-0.1021	8.852	3b
2.5	-0.0800	7.815	3b
2.559	-0.0764	7.677	3b
2.885	-0.0601	7.212	3b
3	-0.0566	7.096	3a
3.412	-0.0429	6.824	3b
3.5	-0.0408	6.785	3b
4	-0.0312	6.611	3a
5	-0.0200	6.429	3a
∞	0	6.153	3c
$4i$	0.0312	5.808	3d
$3i$	0.0556	5.589	3d
$2i$	0.1250	5.111	3d
i	0.5000	3.823	3d
$0.902i$	0.6143	3.609	3d
$0.637i$	1.234	2.91 ^a	3f
$0.557i$	1.611	2.67	3f
$0.477i$	2.193	2.39	3f
$0.446i$	2.518	2.26 ^a	3f
$0.414i$	2.920	2.15	3f
$0.382i$	3.427	2.03	3f
$0.350i$	4.078	1.92	3f
$0.318i$	4.935	1.76	3f
$0i$	∞	0	3e