TABLES DEDUCED FROM THE NEW EXPERIENCE TABLE H^MF (ADJUSTED).

To the Editor of the Journal of the Institute of Actuaries.

SIR,—Having had, by the kind assistance of Mr. James Stark, junr., some monetary tables computed from the Table H^MF of the "*Mortality Experience of Life Assurance Companies collected by the Institute of Actuaries*," I beg to place them at your disposal for publication in the *Journal*.

They are calculated at 3 and 4 per cent. from the table of mortality adjusted by Mr. Woolhouse on Makeham's modification of Gompertz's theory, the formation of which table he has fully explained in the *Journal*, vol. xv pp. 404–408; but I have used the logarithms throughout to five places only, considering them amply sufficient for ordinary official purposes.

Mr. Makeham's formula expressing the law of mortality is

$$\log l_x = \log k - x \log a + q^x \log g$$

and the constants deduced from the original observations in Table H^MF are

$$\log k = 5 \cdot 04119$$
$$\log a = \cdot 00286$$
$$\log g = \cdot 00041$$
$$\log q = \cdot 04$$

The following will show the close approximation to the original facts of the number living at the decennial ages by the adjusted table, and also a comparison of the values of life annuities by the New Experience, by the Experience of 17 Offices, and by the Carlisle Table.

Age.	Table H^MF Number Living.		Value of Single Life Annuity 3 per Cent.		
	Original Facts.	Adjusted Table.	By New Experience.	By Experience of 17 Offices	By Carlisle Table.
20	9554	9581	21·956	21·797	21·694
30	8904	8890	19·912	19·754	10·556
40	8128	8137	17·254	17·123	17·143
50	7183	7198	14·004	13·820	14·303
60	5847	5843	10·368	10·188	10·491
70	3805	3822	6·784	6·685	7·123
80	1411	1454	3·789	3·799	4·365
90	159	142	1·729	1·516	2·499

I remain, Sir,

Yours obediently,

Guardian Assurance Office,
11 *Lombard Street,* 31*st Aug.* 1871.

SAMUEL BROWN.

Table of Mortality H^{MF} (adjusted), *showing the Number Living, the Number Dying, and the chance of dying in a Year, for every Age from* 10 *to* 100.

Age x	l_x	d_x	$1-p_x$	Age x	l_x	d_x	$1-p_x$
10	102698	698	·00679	56	64534	1430	·02216
11	102000	695	·00682	57	63104	1493	·02366
12	101305	693	·00684	58	61611	1557	·02528
13	100612	690	·00686	59	60054	1627	·02710
14	99922	688	·00688	60	58427	1696	·02902
15	99234	688	·00693	61	56731	1769	·03119
16	98546	685	·00695	62	54962	1842	·03350
17	97861	685	·00700	63	53120	1916	·03608
18	97176	684	·00704	64	51204	1992	·03890
19	96492	684	·00709	65	49212	2063	·04192
20	95808	684	·00714	66	47149	2136	·04529
21	95124	683	·00718	67	45013	2203	·04894
22	94441	685	·00725	68	42810	2266	·05293
23	93756	686	·00732	69	40544	2322	·05729
24	93070	687	·00739	70	38222	2372	·06205
25	92383	691	·00748	71	35850	2410	·06722
26	91692	692	·00755	72	33440	2437	·07289
27	91000	697	·00766	73	31003	2451	·07904
28	90303	701	·00775	74	28552	2448	·08576
29	89602	704	·00787	75	26104	2429	·09304
30	88898	712	·00800	76	23675	2391	·10098
31	88186	716	·00812	77	21284	2333	·10961
32	87470	726	·00830	78	18951	2254	·11897
33	86744	732	·00844	79	16697	2156	·12910
34	86012	741	·00862	80	14541	2037	·14010
35	85271	753	·00883	81	12504	1901	·15199
36	84518	765	·00905	82	10603	1747	·16484
37	83753	779	·00930	83	8856	1583	·17872
38	82974	793	·00956	84	7273	1408	·19364
39	82181	808	·00983	85	5865	1230	·20972
40	81373	828	·01017	86	4635	1053	·22703
41	80545	845	·01049	87	3582	879	·24541
42	79700	868	·01090	88	2703	717	·26522
43	78832	890	·01129	89	1986	568	·28628
44	77942	917	·01177	90	1418	438	·30871
45	77025	943	·01224	91	980	326	·33247
46	76082	975	·01281	92	654	234	·35758
47	75107	1007	·01340	93	420	161	·38406
48	74100	1042	·01406	94	259	107	·41181
49	73058	1080	·01479	95	152	67	·44081
50	71978	1121	·01558	96	85	40	·47097
51	70857	1164	·01642	97	45	23	·50217
52	69693	1212	·01739	98	22	12	·53427
53	68481	1261	·01841	99	10	5	·56714
54	67220	1315	·01958	100	5	5	1·
55	65905	1371	·02080				

Table H^{MF} (adjusted).   *Commutation Table, showing also the Value of the Life Annuity a_x with Interest at 3 per-cent, for every Year of Age from 10 to 100.*

Age x	D_x	N_x	M_x	a_x
10	76417·	1793457·	21952·	23·469
11	73687·	1719770·	21448·	23·339
12	71053·	1648717·	20961·	23·204
13	68513·	1580204·	20489·	23·064
14	66060·	1514144·	20033·	22·921
15	63694·	1450450·	19591·	22·772
16	61410·	1389040·	19162·	22·619
17	59208·	1329832·	18748·	22·461
18	57081·	1272751·	18346·	22·297
19	55028·	1217723·	17956·	22·129
20	53047·	1164676·	17577·	21·956
21	51134·	1113542·	17209·	21·777
22	49288·	1064254·	16853·	21·593
23	47505·	1016749·	16506·	21·403
24	45785·	970964·	16169·	21·208
25	44122·	926842·	15841·	21·006
26	42517·	884325·	15521·	20·799
27	40967·	843358·	15209·	20·586
28	39469·	803889·	14904·	20·368
29	38022·	765867·	14607·	20·142
30	36624·	729243·	14317·	19·911
31	35274·	693969·	14032·	19·674
32	33968·	660001·	13754·	19·430
33	32705·	627296·	13480·	19·181
34	31484·	595812·	13212·	18 924
35	30304·	565508·	12949·	18·661
36	29162·	536346·	12689·	18·392
37	28056·	508290·	12433·	18·118
38	26986·	481304·	12180·	17·836
39	25949·	455355·	11930·	17·548
40	24945·	430410·	11682·	17·254
41	23972·	406438·	11436·	16·954
42	23030·	383408·	11192·	16·648
43	22116·	361292·	10948·	16 337
44	21229·	340063·	10706·	16·019
45	20368·	319695·	10464·0	15·696
46	19533·	300162·	10221·9	15·367
47	18721·	281441·	9978·9	15·034
48	17932·	263509·	9735·2	14·695
49	17165·	246344·	9490·4	14·351
50	16419·	229925·	9244 0	14 004
51	15692·	214233·	8995·7	13·652
52	14985·	199248·	8745·4	13·297
53	14296·	184952·	8492·4	12·938
54	13624·	171328·	8236·8	12·576
55	12968·	158360·	7978·0	12·212
56	12328·	146032·	7716·1	11·845
57	11704·	134328·	7450 9	11·474
58	11094·	123234·	7182·1	11·108
59	10499·	112735·	6909·9	10 738
60	9917 0	102818·	6633·7	10·368
61	9348·7	93469·	6354 2	9·998
62	8793·3	84676·	6071·2	9 630
63	8251·1	76425·	5785·1	9 263
64	7721·8	68703·	5496·1	8·897
65	7205·3	61498·	5204·4	8 535
66	6702·1	54796·	4911·1	8·176
67	6212·3	48584·	4616·3	7·821

3 *per-cent Commutation and Annuity Tables*—(continued).

Age x	D_x	N_x	M_x	a_x
68	5736·1	42848·	4321·1	7·470
69	5274·2	37574·	4026·3	7·124
70	4827·3	32747·	3733·0	6·784
71	4395·9	28351·	3442·1	6·449
72	3981·0	24370·	3155·2	6·122
73	3583·3	20787·	2873·5	5·801
74	3204·0	17583·	2598·5	5·488
75	2843·9	14739·	2331·8	5·183
76	2504·1	12235·	2074·9	4·886
77	2185·7	10049·	1829·4	4·598
78	1889·5	8159 9	1596·8	4·319
79	1616·2	6543·7	1378·6	4·049
80	1366·5	5177·2	1176·0	3·789
81	1140·9	4036·3	990·10	3·538
82	939·29	3097 0	821·70	3·297
83	761·61	2335·4	671·45	3·066
84	607·27	1728·1	539·27	2·846
85	475·42	1252·7	425·13	2·635
86	364·77	887·89	328·32	2·434
87	273·74	614·15	247·86	2·244
88	200·54	413·61	182·65	2·062
89	143·07	270·54	131·01	1·891
90	99·136	171·40	91·29	1·729
91	66·535	104·86	61·55	1·576
92	43·121	61·743	40·06	1·432
93	26·895	34 848	25·078	1·296
94	16·083	18·765	15·078	1·167
95	9·1846	9·5803	8·624	1·043
96	4·9864	4·5939	4 700	·921
97	2·5611	2·0328	2·426	·794
98	1·2379	·7949	·1·156	·642
99	·5597	·2352	·513	·420
100	·2352	.. ..	·253	·000

TABLE H^{MF} (adjusted).   *Values of Annuities on Two Joint Lives of Equal Ages, at 3 and at 4 per-cent Interest.*

Ages.		At 3 per-cent Interest.	At 4 per-cent Interest.	Ages.		At 3 per-cent Interest.	At 4 per-cent Interest.
10	10	19·861	16·924	55	55	8·971	8·349
11	11	19 738	16 843	56	56	8·637	8·056
12	12	19·610	16·758	57	57	8·304	7·763
13	13	19·477	16·669	58	58	7·972	7·469
14	14	19·340	16·576	59	59	7·643	7·176
15	15	19·153	16·479	60	60	7 317	6 885
16	16	19·050	16·378	61	61	6·994	6·595
17	17	18·897	16·273	62	62	6·675	6·307
18	18	18·739	16·163	63	63	6·360	6·021
19	19	18·576	16 049	64	64	6·050	5·740
20	20	18·408	15·930	65	65	5·746	5·463
21	21	18·233	15·806	66	66	5·448	5·189
22	22	18·053	15·677	67	67	5·156	4 921
23	23	17·867	15·544	68	68	4 872	4·658
24	24	17·675	15·404	69	69	4·594	4·401
25	25	17·478	15·260	70	70	4·325	4·150
26	26	17·275	15·111	71	71	4·063	3·906
27	27	17·065	14·954	72	72	3·810	3 669
28	28.	16·849	14·794	73	73	3·566	3·440

Joint Life Annuities, 3 *and* 4 *per-cent*—(continued).

Ages.		At 3 per-cent Interest.	At 4 per-cent Interest.	Ages.		At 3 per-cent Interest.	At 4 per-cent Interest.
29	29	16·626	14·627	74	74	3·330	3·218
30	30	16·398	14·454	75	75	3·104	3·003
31	31	16·163	14 276	76	76	2·886	2·797
32	32	15·922	14·091	77	77	2 678	2·599
33	33	15·675	13·901	78	78	2·479	2·410
34	34	15·422	13·704	79	79	2·290	2 229
35	35	15 162	13·501	80	80	2·110	2·056
36	36	14·896	13·292	81	81	1·939	1·892
37	37	14·624	13 078	82	82	1·777	1 736
38	38	14·348	12·858	83	83	1·624	1·588
39	39	14·065	12·631	84	84	1·480	1·449
40	40	13·776	12·399	85	85	1·345	1·318
41	41	13·482	12·161	86	86	1·218	1·194
42	42	13·182	11·917	87	87	1·099	1·079
43	43	12·879	11·668	88	88	·988	·971
44	44	12·570	11·414	89	89	·885	870
45	45	12·257	11·154	90	90	·789	·776
46	46	11·940	10·890	91	91	·700	·690
47	47	11·619	10·622	92	92	·618	·609
48	48	11·295	10·349	93	93	·543	·535
49	49	10·968	10·072	94	94	·474	·468
50	50	10·639	9·792	95	95	·411	·406
51	51	10·308	9·508	96	96	·354	·349
52	52	9·975	9·221	97	97	·301	·297
53	53	9·640	8·933	98	98	·249	·246
54	54	9·306	8·642	99	99	·182	·180

TABLE H^{MF} (adjusted).　*Commutation Table, showing also the Value of the Life Annuity a_x with Interest at* 4 *per-cent, for every Year of Age from* 10 *to* 100.

Age x	D_x	N_x	M_x	a_x
10	69379·	1354883·	14599·9	19·529
11	66257·	1288626·	14146·5	19·449
12	63275·	1225351·	13712·4	19·366
13	60425·	1164926·	13296·2	19·279
14	57702·	1107224·	12897·7	19·189
15	55101·	1052123·	12515·7	19·095
16	52615·	999508·	12148·4	18·997
17	50239·	949269·	11796·7	18·895
18	47969·	901300·	11458·6	18·789
19	45799·	855501·	11133 9	18·679
20	43725·	811776·	10821·7	18·566
21	41744·	770032·	10521·5	18·447
22	39850·	730182.	10233·3	18·323
23	38039·	692143·	9955·4	18·196
24	36309·	655834·	9687·8	18·063
25	34655·	621179·	9430·1	17·925
26	33072·	588107·	9180·9	17·783
27	31560·	556547·	8940·9	17·634
28	30114·	526433·	8708·5	17·481
29	28731·	497702·	8483·7	17·323
30	27409·	470293·	8266·6	17·159
31	26144·	444149·	8055·5	16·989
32	24934·	419215·	7851·4	16·813
33	23776·	395439·	7652·4	16·632
34	22669·	372770·	7459·5	16·444
35	21609·	351161·	7271·7	16·251
36	20594·	330567·	7088·2	16·051
37	19623·	310944·	6909·0	15·846

4 *per-cent Commutation and Annuity Tables*—(continued).

Age x	D_x	N_x	M_x	a_x
38	18693·	292251·	6733·5	15·635
39	17802·	274449·	6561·7	15·417
40	16949·	257500·	6393·4	15·193
41	16131·	241369·	6227·6	14·963
42	15348·	226021·	6064·9	14·726
43	14597·	211424·	5904·2	14·484
44	13877·	197547·	5745·7	14·235
45	13187·	184360·	5588·7	13·981
46	12524·	171836·	5433·5	13·720
47	11888·	159948·	5279 2	13·455
48	11278·	148670·	5125·9	13·183
49	10692·	137978·	4973·4	12·905
50	10128·	127850·	4821·4	12·623
51	9586·9	118263·	4669·7	12·336
52	9066·9	109196·	4518·3	12·043
53	8566·4	100630·	4366·7	11·747
54	8085·4	92544 2	4215·0	11·446
55	7622·4	84921·8	4062·9	11·141
56	7176·6	77745·2	3910·4	10·833
57	6747·8	70997·4	3757·5	10·522
58	6334·8	64662·6	3604·0	10·208
59	5937·0	58725·6	3450·1	9·891
60	5554·1	53171·5	3295·4	9 573
61	5185·5	47986·0	3140·4	9·254
62	4830·5	43155·5	2984·9	8·934
63	4489·1	38666·4	2829·2	8·613
64	4160 7	34505·7	2673·5	8·293
65	3845 0	30660·7	2517·9	7·974
66	3542·2	27118·5	2362·9	7·656
67	3251·7	23866·8	2208·6	7·340
68	2973·6	20893·2	2055·6	7·026
69	2707·9	18185·3	1904·3	6·716
70	2454·6	15730·7	1755·2	6·409
71	2213·7	13517·0	1608·7	6·106
72	1985·5	11531·5	1465 6	5·808
73	1770·0	9761·5	1326·5	5·515
74	1567·4	8194·1	1191·9	5·228
75	1377·8	6816·3	1062·7	4·947
76	1201·6	5614·7	939·45	4·673
77	1038·7	4576·0	822·77	4·406
78	889·28	3686·7	713·30	4·146
79	753·36	2933·3	611·60	3·894
80	630·86	2302·4	518·06	3·650
81	521·62	1780·8	433·08	3·414
82	425·32	1355·5	356·83	3·187
83	341·55	1013·9	289·45	2·969
84	269·72	744·16	230·74	2·759
85	209·13	535·03	180·53	2·558
86	158·91	376·12	138·36	2·367
87	118·11	258·01	103·64	2·185
88	85·696	172·31	75·77	2·011
89	60·545	111·76	53·91	1·846
90	41·551	70·210	37·26	1·690
91	27·619	42·591	24·920	1·542
92	17·727	24·864	16·086	1·403
93	10 950	13·914	9·989	1·271
94	6·4856	7·4283	5·955	1·145
95	3·6680	3·7603	3·377	1·025
96	1·9722	1·7881	1·825	·907
97	1·0033	·7848	·934	·782
98	·4802	·3046	·441	·634
99	·2151	·0895	·194	·416
100	·0895	·· ··	·095	