number of widows that have ever exiſted in the world, would in this caſe be equal to half the number of marri­ages. And what would take place in the world muſt alſo, on the ſame ſuppoſitions, take place in this ſociety. In other words, every other perſon in ſuch a ſociety leaving a widow, there muſt ariſe from it a number of widows equal to half its own number. But this does not determine what number, all living at one and the ſame time, the ſociety may expect will come to be conſtantly upon it. It is, therefore, neceſſary to determine how long the duration of ſurvivorſhip between perſons of equal ages will be compared with the duration of marriage. And the truth is, that, ſuppoſing the probabilities of life to decreaſe uniformly, the former is equal to the latter ; and conſequently that the number of survivors, or (which is the ſame, supposing no ſecond marriages) of widows and widowers alive together, which will ariſe from any given ſet of ſuch marriages constantly kept up, will be equal to the whole number of marriages; or half of them (the number of widows in par­ticular) equal to half the number of marriages. Now it appears that in moſt towns the decreaſe in the probabilities of life is in fact nearly uniform. According to the Breſlaw Table of Obſervation. (ſee Annuity ), almoſt the ſame numbers die every year from 20 years of age to 77. Alter this, indeed, fewer die, and the rate of decreaſe in the probabilities of life is retarded. But this deviation from the hypothesis is inconſiderable ; and its effect, in the preſent caſe, is to render the duration of ſurvivorſhip longer than it would otherwiſe be. According to the London Table of Obſervations, the numbers dying every year begin to grow lels at 50 years of age ; and from hence to extreme old age there is a con­stant retardation in the decreaſe of the probabilities of life. Upon the whole, therefore, it appears that, according to the Breſlaw Table, and ſuppoſing no widows to marry, the number inquired after is ſomewhat greater than half the number of the ſociety ; but, according to the London ! able, a good deal greater. This, however, has been determined on the ſuppoſition that the huſbands and wives are of equal ages, and that then there is an equal chance who ſhall die firſt. But in reality huſbands are generally older than wives, and males have been found to die ſooner than females, as appears inconteſtably from ſeveral of the tables in Dr Price’s Treatiſe on Reverſions. lt is there­fore more than an equal chance that the husband will die before his wife. This will increaſe conſiderably the dura­tion of ſurvivorſhip on the part of the women, and conſe­quently the number which we have been inquiring after. The marriage of widows will diminiſh this number, but not ſo much as the other cauſes will increaſe it.

If the ſociety comprehends in it from the firſt all the married people of all ages in any town, or among any claſs of people where the numbers always continue the ſame, the whole collective body of members will be at their greateſt age at the time of the eſtabliſhment of the ſociety ; and the number of widows lest every year will at a medium be al­ways the ſame. The number of widows will increaſe con­tinually on the ſociety, till as many die off every year as are added. This will not be till the whole collective body of widows are at their greateſt age, or till there are among them the greateſt poſſible number of the oldeſt widows ; and therefore not till there has been time for an accession to the oldeſt widows from the youngeſt part.

Let us, for the lake of greater preciſion, divide the whole medium of widows that come on every year into different classes according to their different ages, and ſuppoſe ſome to be left at 56 years of age, ſome at 46, ſome at 36, and ſome at 26. The widows, conſtantly in life together, de­rived from the firſt class, will come to their greateſt age, and to a *maximum,* in 30 years, ſuppoſing, with Μ. de Moivre, 86 to be the utmoſt extent of life. The ſame will happen to the ſecond claſs in 40 years, and to the third in 50 years. But the whole body compoſed of theſe classes will not come to a *maximum* till the ſame happens to the fourth or youngeſt claſs ; that is, not till the end of 60 years. After this the affairs of the ſociety will become ſtationary, and the number of annuitants upon it of all ages will keep always nearly the ſame.

If a society begins with its complete number of members, but at the ſame time admits none above a particular age : It, for inſtance, it begins with 200 members all under 52, and afterwards limits itself to this number, and keeps it up by admitting every year, at all ages between 26 and 50, new members as old ones drop off; in this caſe, the period neceſſary to bring on the *maximum* of annuitants will be juſt doubled.

To determine the ſum that every individual ought to, pay in a single preſent payment, in order to intitle his widow to a certain annuity for her life, let us ſuppoſe the annuity 3l. *per annum,* and the rate of intereſt four *per cent.* It is evi­dent, that the value of ſuch an expectation is different, ac­cording to the different ages of the purchaſers, and the proportion of the age *of* the wife to that of the husband. Let us then ſuppoſe that every perſon in ſuch a ſociety is of the ſame age with his wife, and that one with another all the members when they enter may be reckoned 40 years of age, as many entering above this age as below it. It has been demonſtrated by Μ. de Moivre and Mr Simpſon, that the value of an annuity on the joint continuance of any two lives, ſubtracted from the value of an annuity on the life in expectation, gives the true preſent value of an­nuity on what may happen to remain of the latter of the two lives after the other.

In the preſent caſe, the value of an annuity to be enjoyed during the joint continuance of two lives, each 40, is, by Table II. 9.826, according to the probabilities of life in the Table of Obſervations formed by Dr Halley from the bills of mortality of Breſlaw in Silesia. The value of a single life 40 years of age, as given by Μ. de Moivre, agreeably to the ſame table, is 13.20 ; and the former ſubtracted from the latter, leaves 3.37, or the true number of years purchaſe, which ought to be paid for any given annuity, to be enjoy­ed by a perſon 40 years of age, provided he ſurvives another perſon of the ſame age, intereſt being reckoned at four *per cent. per annum.* The annuity, therefore, being 3.0l. the preſent value oſ it is 30 multiplied by 3.37, or 101 l. 2 s.

If, inſtead of a single preſent payment, it is thought pre­ferable to make annual payments during the marriage ; what theſe annual payments ought to be is eaſily determi­ned by finding what annual payments during two joint lives of given ages are equivalent to the value of the reverſionary annuity in preſent money. Suppoſe, as before, that the joint lives are each 4c, and the reverſionary annuity 30 l. *per an­num.* An annual payment during the continuance of two ſuch lives is worth (according to Table II.) 9.82 years purchaſe. The annual payment ought to be ſuch as, being multiplied by 9.82, will produce 101 l. the preſent value of the annuity in one payment. Divide then 101.1 by 9.82, and 10.3 the quotient will be the annual pay ment. This method of calculation ſuppoſes that the firſt annual payment is not to be made till the end of a year. If it is to be made immediately, the value of the joint lives will be increaſed one year’s purchaſe; and therefore, in order to find; the annual payments required, the value of a preſent single payment muſt be divided by the value of the joint lives in­creaſed by unity. If the ſociety prefer paying part of the value in a preſent single payment on admiſſion, and the reſt in annual payments ; and it they fix theſe annual payments