

CHAPTER X

DE L'ESPÉRANCE MORALE.

Pierre Simon Laplace

Théorie Analytique des Probabilités §§41–43, pp. 441–454

ON MORAL EXPECTATION

Expression of moral fortune, in departing from this principle that the moral good procured to an individual, by an infinitely small sum, is proportional to this sum divided by the physical fortune of that individual. Expression of the moral fortune resulting from the expectation of any number of events which procure some benefits of which the respective probabilities are known. Expression of the physical fortune corresponding to this moral fortune. The increase of this physical fortune resulting from the awaited events, is that which I name *moral advantage relative to these events*. Consequences which result from these expressions. The game mathematically most equal is always disadvantageous. It is worth more to expose his fortune by parts to some dangers independent of one another, than to expose it all entire to the same danger. By thus dividing his fortune, the moral advantage approaches without ceasing to the mathematical advantage and ends by coinciding with it, when the division is supposed infinite. The moral advantage is able to be increased by means of the funds of assurance, at the same time as these funds produce to the assurers a certain benefit. N° 41.

Explication, by means of the previous theory, of a paradox that the Calculus of Probabilities presents. N° 42.

Comparison of the moral advantage of the placement of a like capital on one head with the one of the placement on two heads. One is able at the same time, by some similar placements, to increase his proper advantage and to assure in the future the lot of the persons who interest us. N° 43.

41. One has seen, in n° 2, the difference which exists between the mathematical expectation and the moral expectation. The mathematical expectation resulting from the probable awaiting of one or many goods being the product of these goods by the probability to obtain them, it is able to be evaluated by the analysis exposed in that which precedes. The moral expectation is ruled on a thousand circumstances which it is nearly impossible to evaluate well. But we have given in the section cited a principle, which, being applied to

the most common cases, leads to some often useful results, and of which we will develop the principals.

According to this principle, x being the physical fortune of an individual, the increase dx that it receives produces in the individual a moral good reciprocal to this fortune; the increase of his moral fortune is able therefore to be expressed by $\frac{k dx}{x}$, k being a constant. Thus, by designating by y the moral fortune corresponding to the physical fortune x , one will have

$$y = k \log x + \log h,$$

h being an arbitrary constant that one will determine by means of a value of y corresponding to a given value of x . With respect to that, we will observe that one is never able to suppose x and y nulls or negatives in the natural order of things; because a man who possesses nothing regards his existence as a moral good which is able to be compared to the advantage that a physical fortune of which it is quite difficult to assign the value would procure to him, but that one is not able to fix below that which would be to him rigorously necessary in order to exist; because one imagines that he would not agree at all to receive a moderate sum, such as one hundred francs, with the condition to claim nothing, when he would have spent it.

We suppose now that the physical fortune of an individual is a , and that the expectation of one of the increases $\alpha, \beta, \gamma, \dots$ occurs to him, these quantities being able to be nulls or even negatives, this which the increases to diminutions. We represent by p, q, r, \dots the respective probabilities of these increases, the sum of these probabilities being supposed equal to unity. The moral fortunes corresponding to the individual will be

$$k \log(a + \alpha) + \log h, \quad k \log(a + \beta) + \log h, \quad k \log(a + \gamma) + \log h, \quad \dots$$

By multiplying these fortunes respectively by their probabilities p, q, r, \dots the sum of their products will be the moral fortune of the individual by virtue of his expectation; by naming therefore Y this fortune, one will have

$$Y = kp \log(a + \alpha) + kq \log(a + \beta) + kr \log(a + \gamma) + \dots + \log h.$$

Let X be the physical fortune which corresponds to this moral fortune, one will have

$$Y = k \log X + \log h.$$

The comparison of these two values of Y gives

$$X = (a + \alpha)^p (a + \beta)^q (a + \gamma)^r \dots$$

If one subtracts the original fortune a of this value from X , the difference will be the increase of the physical fortune which would procure to the individual the same moral advantage which results for him from his expectation. This difference is therefore the expression of this advantage, instead that the mathematical advantage has for expression

$$p\alpha + q\beta + r\gamma + \dots$$

Thence result many important results. One of them is that the mathematically most equal game is always disadvantageous. In effect, if one designates by a the physical fortune of the player before commencing the game; by p his probability to win, and by μ his stake, that of his adversary must be, for equality of the game, $\frac{(1-p)\mu}{p}$; thus the player winning the set, his physical fortune becomes $a + \frac{1-p}{p}\mu$, and the probability of that is p . If he loses the set, his physical fortune becomes $a - \mu$, and the probability of that is $1 - p$; and naming therefore X his physical fortune, by virtue of his expectation, one will have, by that which precedes,

$$X = \left(a + \frac{1-p}{p}\mu \right)^p (a - \mu)^{1-p};$$

now this quantity is smaller than a , that is to say that one has

$$\left(1 + \frac{1-p}{p} \frac{\mu}{a} \right)^p \left(1 - \frac{\mu}{a} \right)^{1-p} < 1$$

or, by taking the hyperbolic logarithms,

$$p \log \left(1 + \frac{1-p}{p} \frac{\mu}{a} \right) + (1-p) \log \left(1 - \frac{\mu}{a} \right) < 0.$$

The first member of this equation is able to be put under the form

$$\int (1-p) \frac{d\mu}{a} \left(\frac{1}{1 + \frac{1-p}{p} \frac{\mu}{a}} - \frac{1}{1 - \frac{\mu}{a}} \right),$$

a quantity which is evidently negative.

There results further from the preceding analysis that it is worth more to expose his fortune by parts to some dangers independent from one another, than

to expose all entire to the same danger. In order to show it, we suppose that one merchant, having to make come by sea a sum ϵ , exposes it on a single vessel, and that the observation has made known the probability p to the arrival of a vessel of the same kind in the port; the mathematical advantage of the merchant, resulting from his expectation, will be $p\epsilon$. But, if one represents by unity his physical fortune, independently of his expectation, his moral fortune will be, by that which precedes,

$$kp \log(1 + \epsilon) + \log h,$$

and his moral advantage will be, by virtue of his expectation,

$$(1 + \epsilon)^p - 1,$$

a quantity smaller than $p\epsilon$: because one has

$$(1 + \epsilon)^p < 1 + p\epsilon,$$

since $\log(1 + \epsilon)^p$ or $p \log(1 + \epsilon)$ is less than $\log(1 + p\epsilon)$, this which is evident, when one puts these two logarithms under the form $\int \frac{p d\epsilon}{1 + \epsilon}$ and $\int \frac{p d\epsilon}{1 + p\epsilon}$.

We suppose now that the merchant exposes the sum ϵ , by equal parts, on r vessels. His physical fortune will become $1 + \epsilon$, if all the vessels arrive, and the probability of this event is p^r . If $r - 1$ vessels arrive, the physical fortune of the merchant becomes $1 + \frac{(r-1)\epsilon}{r}$, and the probability of this event is $rp^{r-1}(1 - p)$. If $r - 2$ vessels arrive, the physical fortune of the merchant becomes $1 + \frac{(r-2)\epsilon}{r}$, and the probability of this event is $\frac{r(r-1)}{2}p^{r-2}(1 - p)^2$, and thus consecutively; the moral fortune of the merchant is therefore, by that which precedes,

$$k \left\{ \begin{aligned} & p^r \log(1 + \epsilon) + rp^{r-1}(1 - p) \log \left(1 + \frac{r-1}{r} \epsilon \right) \\ & + \frac{r(r-1)}{2} p^{r-2}(1 - p)^2 \log \left(1 + \frac{r-2}{r} \epsilon \right) + \dots \end{aligned} \right\} + \log h,$$

an expression that one is able to put under this form

$$(a) \quad kp \int d\epsilon \left[\frac{p^{r-1}}{1 + \epsilon} + \frac{(r-1)p^{r-2}(1-p)}{1 + \frac{r-1}{r}\epsilon} + \frac{(r-1)(r-2)p^{r-3}(1-p)^2}{1.2.(1 + \frac{r-2}{r}\epsilon)} + \dots \right] + \log h.$$

If one subtracts from this expression that of the moral fortune of the merchant when he exposes the sum ϵ on a single vessel, and if one obtains by making $r = 1$

in the preceding, that which, setting aside $\log h$, reduces that here to $kp \int \frac{d\epsilon}{1+\epsilon}$ which is equal to

$$kp \int d\epsilon \left[\frac{p^{r-1}}{1+\epsilon} + \frac{(r-1)p^{r-2}(1-p)}{1+\epsilon} + \frac{(r-1)(r-2)p^{r-3}(1-p)^2}{1.2.(1+\epsilon)} + \dots \right] + \log h,$$

the difference will be

$$kp(1-p) \frac{r-1}{r} \int \frac{\epsilon d\epsilon}{1+\epsilon} \left[\frac{p^{r-2}}{1+\frac{r-1}{r}\epsilon} + \frac{(r-2)p^{r-3}(1-p)}{1.2.(1+\frac{r-2}{r}\epsilon)} + \dots \right];$$

this difference being positive, one sees that there is morally the advantage to partition the sum ϵ on several vessels. This advantage is increased in measure as one increases the number r of vessels, and, if this number is very great, the moral advantage becomes nearly equal to the mathematical advantage.

In order to see this, we take formula (a) and give to it this form

$$(a') \quad kp \int \int dx d\epsilon c^{-(1+\frac{\epsilon}{r})x} (pc^{-\frac{\epsilon x}{r}} + 1 - p)^{r-1} + \log h,$$

the integral relative to x being taken from x null to x infinity. In this interval, the coefficient of dx under the $\int \int$ signs has neither maximum nor minimum; because its differential taken with respect to x is

$$-c^{(1+\frac{\epsilon}{r})x} dx (pc^{-\frac{\epsilon x}{r}} + 1 - p)^{r-2} \left[p(1+\epsilon)c^{-\frac{\epsilon x}{r}} + (1-p) \left(1 + \frac{\epsilon}{r} \right) \right];$$

this differential is constantly negative from $x = 0$ to x infinity: thus the coefficient itself diminishes constantly in this interval. This is therefore here the case to make use of formula (A) of n° 22 of Book I, in order to have, by a convergent approximation, the integral $\int y dx$, y being equal to

$$c^{(1+\frac{\epsilon}{r})x} (pc^{-\frac{\epsilon x}{r}} + 1 - p)^{r-1}.$$

The quantity that we have named ν in the section cited becomes then

$$\nu = -\frac{y dx}{dy} = \frac{pc^{-\frac{\epsilon x}{r}} + 1 - p}{p(1+\epsilon)c^{-\frac{\epsilon x}{r}} + (1-p) \left(1 + \frac{\epsilon}{r} \right)},$$

this which gives

$$U = \frac{1}{1 + p\epsilon + (1 - p)\frac{\epsilon}{r}},$$

$$\frac{dU}{dx} = \frac{p(1 - p)\epsilon^2(1 - \frac{1}{r})}{r[1 + p\epsilon + (1 - p)\frac{\epsilon}{r}]^2},$$

.....,

$U, \frac{dU}{dx}, \dots$ being that which $\nu, \frac{d\nu}{dx}, \dots$ become when x is null. This posed, formula (A) cited will give

$$\int dx c^{-(1+\frac{\epsilon}{r})x} (pc^{-\frac{\epsilon x}{r}} + 1 - p)^{r-1}$$

$$= \frac{1}{1 + p\epsilon + (1 - p)\frac{\epsilon}{r}} \left\{ 1 + \frac{p(1 - p)\epsilon^2((1 - \frac{1}{r}))}{r[1 + p\epsilon + (1 - p)\frac{\epsilon}{r}]^2} + \dots \right\}.$$

Formula (a') becomes thus, to very nearly, when r is a great number,

$$k \int \frac{p d\epsilon}{1 + p\epsilon} + \log h$$

or

$$k \log(1 + p\epsilon) + \log h.$$

Now let X be the physical fortune corresponding to this moral fortune; one has, by that which precedes,

$$k \log X + \log h,$$

for the moral fortune corresponding to X ; by comparing therefore these two expressions, one will have

$$X = 1 + p\epsilon.$$

In this case, the moral advantage is $p\epsilon$; it is therefore equal to the mathematical advantage.

Often the moral advantage of the individuals is increased by the mean of the funds of assurance, at the same time as these funds produce to the assurers a certain benefit. We suppose, for example, that a merchant has a part ϵ of his fortune on a vessel of which the probability of the arrival is p , and that he assures this part, by given a sum to the company of assurance. For perfect equality

between the mathematical lots of the company and of the merchant, the one here must give $(1 - p)\epsilon$ for price of assurance. By representing by unity the fortune of the merchant, independently of his expectation ϵ , his moral fortune will be, by that which precedes,

$$kp \log(1 + \epsilon) + \log h,$$

in the case where one does not assure, and in the case where he assures, it will be

$$k \log(1 + \epsilon) + \log h;$$

now one has

$$\log(1 + p\epsilon) > p \log(1 + \epsilon)$$

or, that which returns to the same,

$$\int \frac{p d\epsilon}{1 + p\epsilon} > k \int \frac{p d\epsilon}{1 + \epsilon},$$

p being less than unity; the moral fortune of the merchant is therefore increased, by means of his assurance. He is able thus to make to the company of assurance a sacrifice proper to defray the expense of the establishment and to the benefit that it must make. If one names α this sacrifice, that is to say if one supposes that the merchant gives to the company, for the price of his assurance, the sum $(1 - p)\epsilon + \alpha$, one will have, in the case of equality of the moral fortunes, when the merchant assures, and when he does not assure at all,

$$\log(1 - \alpha + p\epsilon) = p \log(1 + \epsilon),$$

this which gives

$$\alpha = 1 + p\epsilon - (1 + \epsilon)^p.$$

This is all that which the merchant is able to give to the company, without moral disadvantage; he will have therefore a moral advantage, by making a sacrifice less than this value of α , and at the same time, the company will have a benefit which, as one has seen it, becomes certain, when its relations are very numerous. One sees thence how some establishments of this kind, well designed and sagely administered, are able to be assured a real benefit, by procuring some advantages to the persons who treat with them. This is in general the end of all the exchanges; but here, by a particular comparison, the exchange holds between two objects of like nature, of which one is only probable, while the other is certain.

42. The principle of which we just made use in order to calculate the moral expectation has been proposed by Daniel Bernoulli, in order to explicate the difference between the result of the Calculus of Probabilities and the indication of common sense in the following problem. Two players A and B play at *heads* and *tails*, with the condition that A pays B two francs, if *heads* arrives at the first trial; four francs, if it arrives at the second trial; eight francs if it arrives at the third trial, and thus consecutively to the n^{th} trial. One demands that which B must give to A in commencing the game.

It is clear that the advantage of B, relative to the first trial, is one franc; because he has $\frac{1}{2}$ of probability to win two francs at this trial. His advantage relative to the second trial is similarly one franc; because he has $\frac{1}{4}$ of probability to win four francs at this trial, and thus consecutively, so that the sum of all his advantages relative to the n trials is n francs. He must therefore, for the mathematical equality of the game, give to A this sum which becomes infinite, if one supposes that the game continues to infinity.

However a person, in this game, will not risk with prudence an even rather moderate sum, such as one hundred francs. If one reflects in the least at this kind of contradiction between the calculus, and that which common sense indicates, one sees easily that the person depends on this that, if one supposes, for example, $n = 50$, this which gives 2^{50} for the sum that B is able to hope at the fiftieth trial, this immense sum produces to B not at all a moral advantage proportional to its magnitude, in a manner that there is for him a moral disadvantage to expose a franc in order to obtain it, with the excessively small probability $\frac{1}{2^{50}}$ to succeed. But the moral advantage that is able to procure an expected sum depends on an infinity of circumstances proper to each individual and that it is impossible to evaluate. The only general consideration that one is able to employ in this regard is that, the more one is rich, the less the very small sum is able to be advantageous, all things equal besides. Thus the most natural supposition that one is able to make is that of a moral advantage reciprocal to the wealth of the interested person. This is to that which the principle of Daniel Bernoulli is reduced, a principle which, as one has just seen, makes the results of the calculus coincide with the indications of common sense, and which gives the means to estimate with some exactitude these always vague indications. His application to the problem of which we have just spoke will furnish us a new example of it.

We name a the fortune of B before the game, and x that which he gives to player A. His fortune becomes $a - x + 2$, if *heads* arrives at the first trial; it becomes $a - x + 2^2$, if *heads* arrives at the second trial, and thus consecutively

to trial n , where it becomes $a - x + 2^n$, if *heads* arrives only at the n^{th} trial. The fortune of B becomes $a - x$, if *heads* arrives not at all in the n trials, after which the set is supposed to end; but the probability of this last event is $\frac{1}{2^n}$. By multiplying the logarithms of these diverse fortunes by their respective probabilities and by k , one will have, by that which precedes, the moral fortune of B, by virtue of the conditions of the game, equal to

$$\begin{aligned} & \frac{1}{2}k \log(a - x + 2) + \frac{1}{2^2}k \log(a - x + 2^2) + \dots \\ & + \frac{1}{2^n}k \log(a - x + 2^n) + \frac{1}{2^n}k \log(a - x) + \log h. \end{aligned}$$

But, before the game, his moral fortune was $k \log a + \log h$; by equating therefore these two fortunes, provided that B always conserves the same moral fortune, and passing again from the logarithms to the numbers, one will have, $a - x$ being supposed equal to a' , and making $\frac{1}{a'} = \alpha$,

$$(o) \quad 1 + \alpha x = (1 + 2\alpha)^{\frac{1}{2}}(1 + 2^2\alpha)^{\frac{1}{2^2}} \dots (1 + 2^n\alpha)^{\frac{1}{2^n}};$$

the factors $(1 + 2\alpha)^{\frac{1}{2}}$, $(1 + 2^2\alpha)^{\frac{1}{2^2}}$ go by diminishing without ceasing, and their limit is unity; because one has

$$(1 + 2^i\alpha)^{\frac{1}{2^i}} > (1 + 2^{i+1}\alpha)^{\frac{1}{2^{i+1}}}.$$

In effect, if one raises to the power 2^{i+1} the two members of this inequality, it becomes

$$1 + 2^{i+1}\alpha + 2^{2i}\alpha^2 > 1 + 2^{i+1}\alpha,$$

and under this form the equality becomes evident. Moreover, the logarithm of $(1 + 2^i\alpha)^{\frac{1}{2^i}}$ is equal to $\frac{i \log 2}{2^i} + \frac{1}{2^i} \log(\alpha + \frac{1}{2^i})$, and it is clear that this function is null in the case of i infinite, this which requires that in this case $(1 + 2^i\alpha)^{\frac{1}{2^i}}$ is unity.

If one supposes n infinite in equation (o), one has the case where the set is able to be prolonged to infinity, this which is the most advantageous case to B. a' and consequently α being supposed known, one will take the sum of the tabular logarithms of a rather great number $i - 1$ of the first factors of the second member, in order that $2^i\alpha$ is at least equal to ten. The sum of the tabular logarithms of the following factors, to infinity, will be, to very nearly, equal to

$$\frac{\log \alpha}{2^{i-1}} + \frac{(i+1) \log 2}{2^{i-1}} + \frac{0,4342945}{3\alpha 2^{i-2}}.$$

The addition of these two sums will give the tabular logarithm of $a' + x$ or of a . Thus one will have for a physical fortune a , supposed to B before the game, the value of x which he must give to A at the beginning of the game, in order to conserve the same moral fortune. By supposing, for example, a' equal to one hundred, one finds $a = 107^{\text{fr}}, 89$, whence it follows that, the physical fortune of B being originally $107^{\text{fr}}, 89$, he must then risk prudently in this game only $7^{\text{fr}}, 89$, instead of the infinite sum that the result of the calculus indicates, when one sets aside all moral considerations. Having thus the value of a relative to $a' = 100$, it is easy to conclude from it in the following manner its value relative to $a' = 200$; in effect one has, in this last case,

$$a = (100 + 2)^{\frac{1}{2}}(100 + 2^2)^{\frac{1}{2^2}} \dots = 2(100 + 1)^{\frac{1}{2}}(100 + 2)^{\frac{1}{4}}(100 + 4)^{\frac{1}{8}} \dots$$

But one has just found

$$(100 + 2)^{\frac{1}{4}}(100 + 4)^{\frac{1}{8}} \dots = (107, 89)^{\frac{1}{2}};$$

therefore

$$a = 2\sqrt{101.107, 89} = 208, 78.$$

Thus the physical fortune of B being originally $208, 78$, he is not able to risk prudently in this game beyond $8^{\text{fr}}, 78$.

43. We will now extend the principle exposed above to the things of which the existence is removed and uncertain. For this, we consider two persons A and B, who wish to each invest, in a life annuity, a capital q . They are able to make it separately; they are able to associate and to constitute a life annuity on their heads, in a manner that the pension is reversible to the one who survives the other. We examine what is the most advantageous part.

We suppose the two persons of the same age and having the same annual fortune that we will represent by unity, independently of the capital that they wish to place. Let β be the life pension that this capital would produce to each of them, if they placed their capitals separately, so that their annual fortune becomes $1 + \beta$. We will express, conformably to the principle of which there is concern, their corresponding annual moral fortune by $k \log(1 + \beta) + \log h$. But this

fortune will take place only probably in the x^{th} year; thus, by designating by y_x the probability that A will survive to the end of the x^{th} year, one must multiply his annual moral fortune relative to this year by y_x ; by adding therefore all these products, their sum, that we will designate by $[k \log(1 + \beta) + \log h]y_x$, will be that which I name here *life moral fortune*.

We suppose now that A and B place the sum $2q$ of their capitals on their heads, and that that produces a life pension β' , reversible to the survivor. So long as A and B will live, each of them will touch only $\frac{1}{2}\beta'$ of life annuity, and their annual moral fortune will be $k \log(1 + \frac{1}{2}\beta') + \log h$. By multiplying by the probability that they both will live to the end of year x , a probability equal to $(y_x)^2$, the sum of these products for all the values of x will be the life moral fortune of A, relative to the supposition of their simultaneous existence; this fortune is therefore

$$\left[k \log \left(1 + \frac{\beta'}{2} \right) + \log h \right] \sum (y_x)^2.$$

The probability that A will exist alone to the end of the x^{th} year is $y_x - (y_x)^2$; his life moral fortune relative to his existence after the death of B, which renders his annual moral fortune equal to $1 + \beta'$, is therefore

$$[k \log(1 + \beta') + \log h] \sum [y_x - (y_x)^2].$$

The sum of these two functions

$$k \log \left(1 + \frac{\beta'}{2} \right) \sum (y_x)^2 + k \log(1 + \beta') [\sum y_x - \sum (y_x)^2] + \log h \sum y_x$$

will be the life moral fortune of A under the hypothesis where A and B place conjointly their capital.

If one compares this fortune to that which we have just found in the case where they place their capitals separately, one sees that there will be for A advantage or disadvantage to place conjointly, according as

$$\log \left(1 + \frac{\beta'}{2} \right) \sum (y_x)^2 + \log(1 + \beta') [\sum y_x - \sum (y_x)^2]$$

will be greater or lesser than $\log(1 + \beta') \sum y_x$. In order to know it, it is necessary to determine the ratio of β' to β ; now one has, by n° 40,

$$q = \beta \sum p^x y_x,$$

$\frac{1-p}{p}$ being the annual interest of silver. One has next, by the same section,

$$2q = \beta' \sum p^x [2y_x - (y_x)^2];$$

one has therefore

$$\beta' = \frac{2\beta \sum p^x y_x}{\sum p^x [2y_x - (y_x)^2]}.$$

The Tables of mortality will give the values of $\sum y_x$, $\sum (y_x)^2$, $\sum p^x y_x$, $\sum p^x (y_x)^2$; one will be able thus to judge which of the two placements of which there is concern is most advantageous.

Suppose β and β' some very small fractions; the quantity $\log(1 + \beta) \sum y_x$ becomes to very nearly $\beta \sum y_x$. The quantity

$$\log\left(1 + \frac{\beta'}{2}\right) \sum (y_x)^2 + \log(1 + \beta') [\sum y_x - \sum (y_x)^2]$$

becomes

$$\frac{\beta'}{2} [2\sum y_x - \sum (y_x)^2],$$

and, by substituting for β' its preceding value, it becomes

$$\beta \frac{[2\sum y_x - \sum (y_x)^2] \sum p^x y_x}{2\sum p^x y_x - \sum p^x (y_x)^2},$$

there is therefore advantage to place conjointly, if

$$[2\sum y_x - \sum (y_x)^2] \sum p^x y_x$$

surpasses

$$[2\sum p^x y_x - \sum p^x (y_x)^2] \sum y_x,$$

or if one has

$$\frac{\sum p^x (y_x)^2}{\sum p^x y_x} > \frac{\sum (y_x)^2}{\sum y_x};$$

it is in effect this which holds generally, p being smaller than unity.

The advantage to place conjointly the capitals increases by the consideration that the increase $\frac{\beta^1}{2}$ of revenue arrives to the survivor, at an ordinarily advanced age, in which the greatest needs which are sensed render it much more useful. This advantage increases yet on all the affections which are able to attach the two individuals to one another, and which make them desire the well being of the one who must survive. The establishments in which one is able thus to place his capitals and, by a slight sacrifice of his revenue, to assure the existence of his family for a time where one must fear no longer to be sufficient to his needs, are therefore very advantageous to the dead, by favoring the softer penchants of nature. The offer not at all the inconvenience that we have remarked in the even more equitable games, the one to render the loss more sensible than the gain, since on the contrary they offer the means to exchange the superfluous against some assured resources in the future. The Government must therefore encourage these establishments and to respect them in its vicissitudes; because the expectations that they present carry onto an extended future, they are able to prosper only to shelter from all anxiety on their duration.

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