ticular characteristic of the animals may be affected by the "training" of their ancestors, and to look for nothing else, seems a sterile procedure. Antecedent to the discovery of specific mechanisms through which specific effects may be "transmitted," a change in the diameter of the vibrissae of the rodents or of the coloration of the skin is just as probable an effect as a change in some detail of behavior. The chances of positive results are (if I may use an analogy merely for illustration) of the order of the chances of discovering a penknife lost in a ten-acre field by making a chart of the field, and then stabbing blindfold at the chart with a pencil. Scientists generally may well be expected to be uninterested in any such attempts.

That characters are "transmitted" in certain specific cases, namely, where certain characteristics of unicellular animals are concerned, Jennings has demonstrated. This search was useful because there an antecedent probability of the resemblance of cause and effect was revealed through expert knowledge of the genetic mechanism. With the higher animals no such mechanism has been discovered. The protection of the germ-cells is such that chemical factors alone can affect them, and there is an enormous gap between means to the production of a chemical effect in the body of the parent and the particular result which the chemical change will have in the germ-cells. Ultimate study of the chemistry of vital processes may in time indicate the effects of certain substances on the germ-cells, but there is as yet no body of information on that point, or on the chemical changes in the parent organism produced by various environmental factors and by bodily activities, competent to furnish the least basis for prediction.

There is, however, an aspect of the search for the "transmission of acquired characters" which is frequently overlooked, but which needs emphasis. The suggestion that such transmission may occur is drawn, in modern times at least, from the scheme of animal evolution. A simple and easy explanation of evolution is provided by the assumption that the adaptations an animal is forced to make to its environment affect, in some mysterious way, the structure of the animal's progeny, so that less individual adaptation is needed on their part. The postulate of sympathetic magic is here drawn upon to fill an embarrassing logical gap in biological theory. Most Lamarckians, apparently, are willing to stop here, but not all are so timid. If this is the true explanation of evolution, then there are superphysical causes at work in the world—causes of which science takes no cognizance. This is the implication of the "transmission of acquired characters" which most Lamarckians would glady deny, but which, in fact, is the real justification of their efforts.

If the mechanism of "transmission" is not through channels which can be accounted for in terms of chemistry and physical chemistry, then there are (if "transmission" is a fact) forces or entities at work which do not operate in the physical realm. If the "transmission of acquired characters" should be demonstrated for the higher vertebrates, we should be obliged to reconsider the subjects of divine intervention, telepathy and the whole gamut of "spirit manifestations" from a new point of view. Moreover, we should be obliged to admit that there is an actual foundation for the popular belief in sympathetic magic.

We admit that superstition always has its bases, although these bases are usually not such as would be easily recognized. Hence, psychologists and others have commonly lent an attentive ear and given largely of time and energy to alleged phenomena of the occult. The uniformity with which these phenomena vanish into thin air when subjected to investigation by rigorous laboratory methods has convinced us finally that there is nothing of value to be obtained in this direction. The "transmission of acquired characters" is, however, of a different order. The rats and rabbits are available in unlimited numbers. They do not refuse to work when their methods of procedure are uncovered. Experiments carried out in one laboratory can be repeated in others. This, then, is the obvious direction of work for those who are interested in the problem of a "supernatural" (or infranatural or endonatural) world. The skeptical scientists should not by any means discourage or scoff at these efforts. On the contrary, they should encourage and facilitate the investigations, for either positive or negative results are of value. But the investigations should be carried out with the cooperation of skeptics and under the observation of more than one technically qualified person. There is little use in guessing at flaws after results are reported.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

LIFE MEMBERSHIP

A LARGE portion of the permanent endowment of the American Association consists of the fees that have been paid by life members, which constitute a fund that is kept permanently invested by the treasurer, only the income therefrom being available for

appropriation by the council. The life-membership fee, which was formerly $50, has been $100 since January 1, 1920, when the annual dues were increased from $3 to $5. On September 30, 1929, the life-membership fund amounted to $44,250, from 663 life-membership payments. For the association year closed on the date just mentioned the treasurer's income from this fund was about $2,126, against which is to be charged the three-dollar journal subscriptions for 453 living life members, leaving a balance of about $767 available for appropriation. This available balance increases from year to year, through the receipt of additional one-hundred-dollar fees and through the decease of life members, for each one-hundred-dollar fee now pays an annual income of about $4.80, and journal subscriptions are of course paid only for living life members. Many fifty-dollar life memberships are still active, and the annual income from these alone is not sufficient to pay for their journal subscriptions.

It is clearly to the advantage of the work of the association that annual members should become life members, although the amount of the annual dues is at present somewhat greater than the annual income from the one-hundred-dollar life-membership fee, for this income is to continue in perpetuity and the payment of annual dues ceases with the resignation or death of the annual member. The present financial relations between the two kinds of membership are shown below, it being understood that the three-dollar payment for the journal subscription has been deducted in each case.

For the period:	Net annual income, available for appropriation, from: Each annual member (paying $5 dues)	Each life member (paying $100 fee)
Before resignation or decease	$2.00	$1.80
After resignation or decease	——	$4.80

A cursory examination of the recently published list of members (Part II of the Summarized Proceedings of the American Association for 1925–29) suggests that our roll of life members might be greatly increased if the serious attention of all annual members might be attracted to this means of aiding the advancement of science throughout the indefinite future. In the association year that closed September 30, 1929, there were enrolled forty-eight new life members, an unusually large number in our records, but nevertheless remarkably small when we consider that the total number of members in good standing at the end of that association year was 17,520 and that 2,992 persons had joined the association in the year. Only about 2.46 per cent. of the members in good standing were life members on September 30, 1929. There must be thousands of annual members whose mental attitudes and economic circumstances might be expected to lead them to become life members if they were to consider this suggestion from all sides.

Not all of the life-membership fee of $100 is to be reckoned as an out-and-out gift and nothing else, for life members really gain in several somewhat intangible ways and they do receive actual money value from the association in return for their contributions. They have the satisfaction of having inaugurated their share of the permanent endowment. Their names are specially designated in the published list of members. The complete roll of life members is kept separate from the regular current roll and is separately published from time to time. They have made it certain that their names will remain on the membership list throughout their lives and on the special roll in perpetuity. They are entirely freed from the trouble and responsibility of making a remittance each year but they are assured that the membership journal will continually come to them as long as they live and that they will have all the privileges of membership throughout their lives.

On a financial basis it is easy to show that life members receive from the association considerable returns for their one-hundred-dollar payments. They each purchase a perpetual annuity for the association, but they do so at a much reduced rate because of the fact that each life member has a life interest in the endowment fund and receives as an annuity for his life period the equivalent of the regular annual dues. But membership with the membership journal is worth more to a member than the amount of the annual dues, for the regular subscription price for SCIENCE is more than an annual member pays for both membership and journal together. A life member therefore receives annually from the association the equivalent of much more than $5 a year. It is safe to say that he gets more than the equivalent of interest at 6 per cent. on the life-membership fee although he has contributed to the association the principal of the fee. While both annual members and life members contribute to the available funds of the association throughout the period of membership and throughout life, respectively, and although the amount thus annually contributed by an annual member is actually a little larger than the annual income received by the association from the life membership fee, yet we must remember that the ultimate contribution of a life member is unlimited.

From the standpoint of actuarial probability and banking discount, the cost of life membership to the life member and his prospective estate is somewhat greater than the present cost of annual membership, but the difference may be accounted for (without reference to philanthropy) by the fact that the life member has purchased the assurance that his membership, with the journal subscription, will be continued as long as he lives. On a strictly financial basis a life membership of about forty-one years' standing is, at present, a clear asset to its holder and to his prospective estate. If an annual member were to establish an invested fund of $100 with average interest of 4 per cent., allowing the interest to be always added to the principal and paying from the fund the annual dues of $5 each year, the fund would not be used up till the forty-first year. After that year, if such a careful member were to continue his annual membership, it would be necessary for him to find other funds with which to pay the annual dues from year to year.

Attention needs to be drawn, however, to still another consideration, which is in favor of the life member as compared with the annual member; namely, that the annual dues are much more likely to be increased than to remain at their present magnitude. As every one knows, they are now exceptionally low, when they and the association journal are compared to the dues, journals, etc., of other similar organizations, and it is highly probable that the annual dues of the American Association may be increased in the near future. When this occurs it will of course have no effect at all on the financial relations of those who are life members at the time; it will make no difference to them whether the annual dues or the life-membership fee may or may not be increased. It is probably a safe prediction that the annual dues will never be decreased.

In some few instances it is necessary for an annual member to allow arrearage to accumulate and the names of such members are carried on the association roll until arrearage amounts to two years. Life membership offers a special attraction to those members. Of a total enrolment of 18,462 on September 30, 1929, there were 327 names in arrears for two years (these were dropped from the roll on the following day, October 1) and 615 names in arrears for one year (these names are to remain on the roll till October 1, 1930, when they will be dropped unless arrearage, or at least back dues for one year, shall have been paid in the meantime). (Note, however, that these annual members in arrears are not in good standing and that the membership journal subscription is discontinued when arrearage amounts to four months.) According to a special ruling of the council, any annual member in arrears for less than two years may be reinstated and may become a life member by paying the life-membership fee. Life membership begins with the year in which the fee is paid and the fee may be paid at any time before September 30, which is the last day of the fiscal year of the association.

It should be mentioned also that an annual member who has paid the dues for the current year may have them refunded when he pays the life-membership fee. New members may have the entrance fee ($5) remitted if they become life members when they join.

It is desirable that a sort of campaign for increasing the number of life members of the association should be carried out from time to time, and such a campaign is to be a feature of the present association year. How many new life members will be enrolled before the opening of the Des Moines meeting?

BURTON E. LIVINGSTON,
Permanent Secretary

OBITUARY

JOHN STERLING KINGSLEY

DURING the late summer of 1929, the many friends of Dr. John Sterling Kingsley were shocked to learn of his death and burial at sea. In company with his daughter, Mary, he had undertaken a trip around the world which, as he wrote to friends, was to be his "last great adventure." It was indeed that in a deeper sense than he realized. His death occurred on the steamship *President Taft* when three days out of Yokohama and was probably due to an aortic stenosis. He was found in his berth with an open book and his light turned out.

A year ago, when he was considering whether or not he could attend the Zoological Congress in Padua in 1930, he wrote that "finances and my strength are the principal questions. But don't think from this that I am weak, for I am in the best of condition." He evidently overestimated his strength, and his death at the age of seventy-five removes a well-known and much-loved personality from our midst.

John Sterling Kingsley was born at Cincinnatus, New York, on April 7, 1854. Two years after his birth the family moved to Norwich, the county-seat of Shenango County, where his father presided as judge over the County Court. Kingsley's early education was received in the private academies of Cincinnatus and Norwich. At the tender age of twelve his scientific bent was manifested in the publication of a weekly chemical journal of which he was both owner and editor.