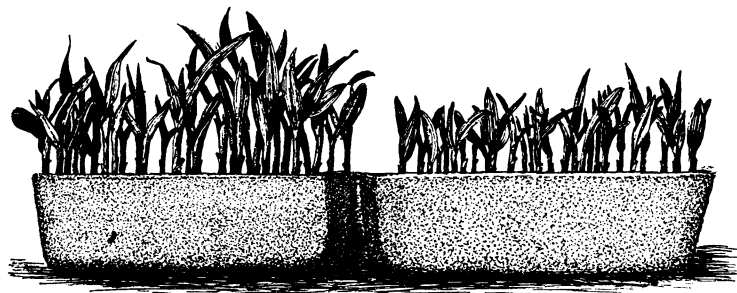


11. The soaking of seeds does not appear to influence the total amount of sprouting.
12. The results of soaking appear to vary in different species.
13. The character of soil in which the test is made may influence the results, both in rapidity and per cent of sprouting.
14. Light has great influence upon the sprouting of the seeds of some species.
15. When light has any influence, it retards or wholly prevents sprouting.
16. The effects of light upon sprouting are different in different species.
17. The weight of the seed is often a tolerably accurate measure of its viability, as determined both by rapidity and per cent of sprouting.
18. As a rule, heavy seeds germinate better than light ones of the same sample.
19. Seeds of different species may vary in sprouting in reference to weight.
20. The color of the seed in some cases is a tolerably accurate measure of rapidity and per cent of sprouting.
21. When there is any variation in viability in reference to color, it is usually found that the stronger sproutings occur in the darker-colored seeds.
22. The relative values of seeds of different colors vary with each species, or sometimes with each sample.
23. The latitude in which seeds are grown may determine their behavior in germination.
24. Northern-grown corn appears to germinate quicker than

In the ordinary farmer's garden, seed-testing is perhaps of little or no value; but to the market-gardener, who plants considerable areas to special crops, and to the seedsman, it is highly profitable. It is possible that in some cases the character of the crop can be prognosticated with some degree of certainty from behavior of plants in germination, wholly aside from percentages of sprouting. The studies of experts in this country and Germany indicate, that, when accurate information is desired as to the value of seeds, the seed-test should present at least the following data: name of variety, where grown, when grown, how kept, per cent by weight of foreign matter, per cent by weight of apparently good seeds, nature of foreign material, weight of seeds, manner of testing, number tested, average and extreme temperatures during trial, first germinations in hours, last germinations in hours, per cent by number germinated, per cent unsprouted but sound at end of trial, date of test, estimate of agricultural value.

#### INHERITANCE OF INJURIES.

PROFESSOR A. WEISMANN of Freiburg, Germany, has made some experiments on mutilation. On Oct. 17, 1887, he had the tails removed from seven female and five male white mice. On Nov. 16 the first brood appeared. These and all subsequent broods were removed from the cage. Up to Dec. 17, 1888, 333 young were born, and in none of them was there any sign of the mutilation being inherited. In cage 2, fifteen young, of Dec. 2 1887, were placed, their tails having been removed. These, up to Dec. 17, 1888, produced 233 young, all with normal tails. In cage 3



Ithaca.

FIG. 7.

Alabama.

southern-grown corn. It is to be expected, from our knowledge of the variation of plants in reference to latitude, that seeds of most species will give similar results.

25. Variation in results of seed-tests may be due to the apparatus in which test is made.

26. Those apparatus in which the seeds are exposed to light are to be distrusted.

27. Those apparatus which afford no protection to the seeds other than a simple layer of cloth, paper, board, or similar cover, are usually unsafe, from the fact that they allow of too great extremes in amounts of moisture.

28. The so-called Geneva tester appears to give better results of sprouting than tests made in soil, probably from the fact that moisture and temperature are less variable than in the soil-tests.

29. In order to study germination to its completion, tests must be made in soil.

30. Tests made indoors are more reliable than those made in the field.

II. Results commonly vary between tests made under apparently identical conditions, even with selected seeds: therefore one test cannot be accepted as a true measure of any sample of seeds.

III. The results of actual ordinary planting in the field cannot be considered a true measure of the viability or value of any sample.

IV. Rapidity of sproutings, unless under identical conditions, is not a true measure of vitality or vigor of seeds.

V. There appears to be no pernicious adulteration of garden-seeds in this country, and, as a rule, there are no hurtful impurities.

fourteen young of the second generation, with tails removed, were placed; and up to Dec. 17, 1888, they produced 141 young, all quite normal. The experiment was carried, with a negative result, down through five generations of mutilated animals. The length of tail of new-born mice varies from 10.5 millimetres to 12 millimetres. In the series of experiments, 849 young were produced by mutilated progenitors, and in no case was a mouse produced with its tail less than 10.5 millimetres. The author points out, that, while it might be said that experiments through a far greater number of generations were needed, the so-called cases of inheritance of mutilation all imply that the mutilation is impressed on the immediately following generations. A mother breaks her finger, and her daughter has the joint of the corresponding finger imperfect. A cow has her horn torn off, and in due course gives birth to a one-horned calf. Moreover, there are many cases of mutilations which have been made for hundreds of years without result. For instance, Settegast shows that all the crows but the rook have bristly feathers on their beaks. Rooks, too, have these feathers while nestlings; but later on they lose them by perpetually pushing the beak into the ground in search of food. There are a great many cases which at first sight appear to prove the inheritance of injuries. As an example of how easy it is to be deceived, Weismann relates that a friend had a vertical scar (with comb-like striæ) on the left ear, the result of a sword-wound. On the left ear of this gentleman's daughter was a curiously similar marking. But it was ultimately noticed that on the right ear of the father was an appearance precisely similar to that on the left ear of the daughter. On closer examination of the father's left ear, there was seen under the scar a linear streak, from which the striæ ran, forming a comb-like structure. It was this, doubtless a

congenital variation, and not the accidental scar, that the daughter had inherited.

#### AMATEUR PHOTOGRAPHY IN THE SUMMER OF 1889.

THOSE who ventured to take photographs with the dry plates of eight years ago thought the art a simple one, and well suited to the needs of every one who was willing to go to any trouble in securing photographic record of sights and scenes in which he might be interested.

A year ago the Kodak was brought on the market. In this camera, which is known to all, and whose products are so favorably received wherever shown, in place of the glass negative of the

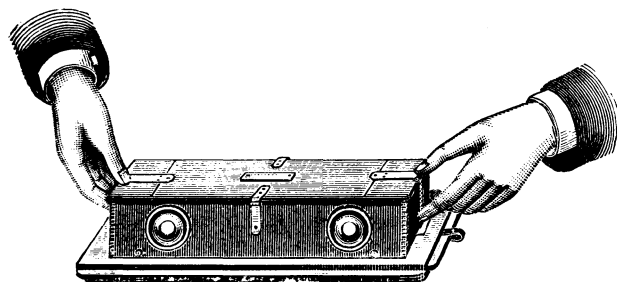


FIG. 1.

past was substituted a strip of sensitized paper stretched between two reels.

This was but a partial solution of the problem, for the paper is of necessity opaque, and to secure the best results it was necessary to strip the delicate film from the paper and attach it to glass or some other transparent support. This was a tedious process. A recent discovery and invention by Mr. George Eastman of the well-known firm in Rochester, obviate every difficulty. He has succeeded in producing a strong and perfectly transparent support, of great flexibility and extreme thinness, which can be wound upon rollers, to be exposed, developed, and printed like ordinary glass negatives. The transparent support is a modification of celluloid, specially prepared by a process invented by Mr. Eastman. The celluloid product is but four one-thousandths of an inch in thickness, and the gelatine film upon it is one two-thousandth of an inch

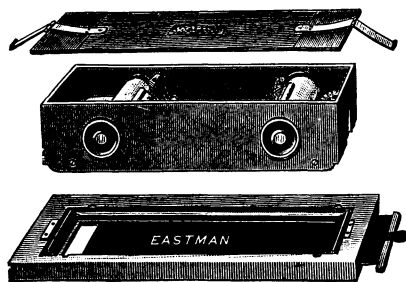


FIG. 2.

in thickness. It will thus be seen that a great magazine of photographic material can be carried in a very small space, and with no inconvenience on account of weight. Every operator can develop and print his own negatives and refill his magazine, with the exercise of only ordinary skill.

Mr. Eastman has removed the greatest difficulty in the way of rapid and satisfactory outdoor work, while adding facility in indoor photography, especially on large work. The handling of large plates is always difficult, and attended with serious risks. The flexible, transparent support makes the handling easy, and the results secure. The new support has been thoroughly tested. It withstands sun-heat necessary in printing, and is unaffected by the chemicals employed in development and other photographic processes.

The accompanying illustrations show the film-holder for the Kodak camera. Fig. 1 shows the holder closed; and Fig. 2, the same open, with a view of the two reels.

#### HEALTH MATTERS.

##### The Alleged Spontaneous Combustion of the Human Body.

WHEN "Bleak House" appeared, in 1853, novel-readers were treated to a new sensation in the way of a death-scene, when Krook was taken off the stage by spontaneous combustion, "of all the deaths that can be died." The public shuddered, and medical readers smiled. The subject was then to most physicians, as it is now, well inside the border of medical mythology.

Within the past year or two, several cases have been put on record, which, with the list previously accumulated, serve to establish pretty clearly, in the opinion of *The Boston Medical and Surgical Journal*, "the fact of an occasional abnormally increased combustibility of the human body, which, it should be observed, does not necessarily imply ignitability, or true spontaneous combustion."

For instance: Dr. Booth's case, which is reported, with a photograph of the nearly consumed remains, in the *British Medical Journal* (vol. i. 1888, p. 841), is of a pensioner, aged sixty-five, of very intemperate habits, who climbed into a hay-loft while drunk, at nine P.M. Neighbors saw by a skylight a light struck, which after a while was put out. At eight the next morning, the body, with all its soft parts consumed, was seen lying over a hole in the floor which had nearly burned through, but had one or two joists that kept the body from falling through. The chance of the application of fire to the man's clothes is here distinctly stated; and the combustion, remarkable as it was, is not shown to have been spontaneous.

Again, Middlekamp, in the *St. Louis Medical and Surgical Journal*, October, 1885, reported a similar case of nearly complete combustion, where the victim, a man of sixty-six and a drunkard of twenty years' standing, fired a gun at his own breast with a ramrod. Here the heat was so intense as to melt the ramrod and a metal buckle. The body was consumed entirely, except the lower part of the legs, the head, and the arms.

In the *Therapeutic Gazette* of the current year, two more such instances are reported. One of these, Dr. Clendenin's case, was an old Irish woman, addicted to the excessive use of whiskey, of which she had drunk a quart the day she died. She had always been the last of the household to go to bed, and so always extinguished the tallow candle (their sole means of illumination). There was also a fire in the kitchen stove. The inner walls of the house were covered with greasy soot, and the two old men who were the only other occupants were both asphyxiated. A hole was found burned through the kitchen floor about two and one-half by three feet square. Upon examining the opening in the floor, a mass of cinders was discovered on the ground beneath. Upon removing them, the skull, the cervical, and half the dorsal vertebrae were found reduced very nearly to a cinder, also about six inches of the right femur, together with part of the ilium in about the same state as the vertebrae. The feet were found in the shoes: the left foot was reduced to a cinder, the shoe being partially calcined; the other foot and shoe were reduced to a complete cinder. On removing, the entire remains of a woman, who a few hours previous had weighed one hundred and sixty pounds, were placed in a box that would hold less than one bushel. The entire remains weighed twelve pounds. The pine joint against which the remaining cinders lay were slightly charred, but not burning when found.

To burn the human body, under ordinary circumstances, as the editor of the journal states, is not an easy thing. The great heat secured in crematories, and the length of time even then requisite to incinerate the body, illustrate this fact. It has been shown that the body is three-quarters water, and a great deal of combustible material is a necessary adjunct to the successful reduction of so non-inflammable a substance. What, then, is it that occasionally imparts to it so abnormal a susceptibility to flame? Here theories are at fault. We may safely say that it is not, as has been claimed by some, alcohol deposited in the tissues: for Liebig found that flesh saturated in that liquid would burn only until the alcohol was consumed. The hydrogen theory is also fanciful; and the best explanation, namely, an abundant deposit of fat in the cells of the body in such cases, fails to account for the fact that not