can do better than others, let it be tragedy writing or standing on our heads. In children this love of admiration or notoriety, instead of being judiciously cloaked, is ingenuously explicitly manifested. So, not impossibly, once discovered, this initial potentiality might have been developed.

In the elementary school in which the writer himself graduated, after every show or circus we always tried, as boys will, to emulate the somersaulting, walking on the hands, and the various bodily contortions which won our admiration in our favourite demi-god. Far and away the most successful of us—we numbered eighty or ninety—were invariably a barber's three sons. This barber, though he was then for a score of years hard and fast at his trade, had been in early life for many years a circus rider. We were all then very young, between seven and twelve. We and they were then unaware of this circumstance. Even if aware of it they could not have been in any way impelled by it except as an instinct.

This case is adduced as supporting the former instance and its deduction. In picking up facts out of books—the sole idea of education in our neighbourhood—the barber's boys were not quite so good as the average of us, but to double somersaulting they took like ducks to water.

As correlative to the saying that it takes three generations to make a gentleman, you will find among trades-folk the statement that it requires an equal number of generations to turn out a first-rate craftsman. I met this opinion first in a pottery district. I came across it since among people of the same class in three countries, and in many distinct districts of one of them. Now if this opinion be sustainable—and personally I think so—then increasing potentiality from generation to generation, or, what it amounts to, the inheritance of acquired powers, is a fairly legitimate inference.

The transmission of like fundamental potentiality, indeed, should scarcely be questioned. The transmission of acquired potentialities, or of capacities enlarged and increased by use, is a further matter; but countless instances such as those given above could, I am convinced, be adduced in support of it. It would be hard to resist their accumulated force. It is anyway *a priori* what is to be expected, and the principle is so important that on its truth depends the perfectibility, at least, of man. To explain the transmission of this fresh inheritance remains, I think, the sole problem for men of science. Its solution, so far as I have observed, is hardly yet within sight.

The Stauhaun, Drogheda.

J. M.

The Mnemic Theory of Heredity.

FIFTEEN years ago NATURE allowed me to direct attention to certain variations in the arrangement of hair on the animal body, and this was followed by several other communications elsewhere on the same subject. The conclusion from these observed facts, which were very numerous, though intrinsically unimportant, was that only by the doctrine that acquired characters can be transmitted were they to be explained. No biologist has ever challenged this conclusion, except by criticising some detail in the observations, or by saying, in effect, "Let us change the subject!" But this large body of small facts remains on record, and the smaller the individual facts are shown to be the stronger is the evidence that they are removed from the province of Selection.

If it were not for the statement, made on the high authority of Prof. Dendy, as to the "rapidly accumulating evidence" in favour of the doctrine that acquired characters can be transmitted, I would not have ventured to bring up this vexed question. But the evidence of these facts is entirely in agreement with the mnemic theory of heredity, as it seems to me; and in view of the attitude of Dr. Beard, and many other biologists, towards the doctrine of the possibility of the transmission of acquired characters, it seems necessary to bring forward facts, and more facts, however small they appear to be. After all, "things are what they are," and theories very soon after they become orthodox have a way of breaking down.

WALTER KIDD.

February 12.

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Distaste of Birds for Butterflies.

IN view of the recent discussions in NATURE regarding the distaste of birds for butterflies (December 21, 1911), it will doubtless be of interest to know of the results of an investigation into the relation of birds to an outbreak of butterflies (*Eugonia californica*) in northern California during the summer of 1911.

The fact that in the examination of some 40,000 stomachs by the U.S. Biological Survey there have been but few instances where birds have been found to feed on butterflies makes the results of the investigation carried on by the California Fish and Game Commission with respect to the recent outbreak of still greater interest.

During the early part of the summer the snow brush (*Ceanothus* sp.) was entirely defoliated by the work of the larvæ of *Eugonia californica* in many places in the mountain districts of the northern part of California. During the latter part of July and the first weeks of August the great army of caterpillars had transformed into butterflies. These insects were so numerous that the ground was often blackened by them, and great swarms of them filled the air from morning until evening.

Field observation showed the Brewer blackbird (*Euphagus cyanocephalus*) to be the most efficient destroyer of the butterflies, certain individuals being observed to eat an average of five butterflies a minute. Two other birds, the western kingbird (*Tyrannus verticalis*) and the western meadowlark (*Sturnella neglecta*), were seen to feed on the insects.

Stomach examination revealed the fact that two other birds, the blue-fronted jay (*Cyanocitta stelleri frontalis*) and the Say phoebe (*Sayornis sayus*), fed on the butterflies to some extent. Sixty-one stomachs in all were examined, representing twenty-one different species. Forty-five species of birds were noted in the locality where the investigation was carried on.

The most important fact brought out by the work was that birds will turn to food which is abundant and readily accessible, even though it be a little-relished type of food.

H. C. BRYANT.

East Hall, University of California, Berkeley,
Cal., January 27.

Thomas Young and Göttingen.

THOMAS YOUNG, more particularly famous as the founder of the wave theory of light, and whom Helmholtz described as one of the most clear-seeing men who had ever lived, matriculated at Göttingen University on October 29, 1793, and took the doctor degree there in medicine on April 30, 1796.

This fact is little known, even among Young's admirers. Indeed, it had escaped the knowledge of the Göttingen authorities. With the view of perpetuating Young's memory at Göttingen, the present writer brought the matter before the notice of Dr. E. Riecke (professor of experimental physics at Göttingen University). Prof. Riecke placed the matter in the hands of the Pro-Rektor, Geh. Rat. Prof. Dr. W. Voigt, who instituted inquiries as to the place of Young's abode.

It transpired that Young had lived in the building which later became the Physikalisches Institut, and is now the Institut für Angewandte Mechanik und Mathematik. It is a pleasing coincidence that in this same building Gauss and Weber did their work on the first electromagnetic telegraph.

Shortly before Christmas, as a result of Prof. Voigt's representations to the Magistrat of the town, a neat little tablet to the memory of Thomas Young was affixed. This tablet is in appropriate proximity to that in memory of Gauss and Weber.

To Prof. Voigt grateful acknowledgment is due for the enthusiastic and warm-hearted manner in which he has superintended the erection of this little memorial to one of the greatest of all physicists.

H. S. ROWELL.

Glazed Frost.

REFERRING to the letters of Mr. Charles Harding and Prof. Meldola on the phenomenon of freezing rain, I remember the occasion referred to; it was on January 11, 1868, when trees were covered with ice by rain which

froze instantly on touching a solid object. In driving through Richmond Park I noticed the branches bending under a weight of clear ice, and, what was even more remarkable, the windows of my cab becoming thickened by a layer of ice while the temperature was just at the freezing point. Rain had been falling continuously until the afternoon, when the drops began to solidify on contact. From roofs and gates long icicles were formed, increasing in size; the grass was sheeted with ice, although the ground had not been chilled by frost.

It is not easy to explain the passage of very cold drops through a warm layer of air without their temperature being raised nearly to that of the layer, but, since the objects on which they fell must have been above or about the freezing point, the drops must have brought with them a degree of cold sufficient not only to cause instant solidification, but to retain the solid state some time after falling and to refrigerate the objects. The size of the drops was not unusual.

ROLLO RUSSELL.

PROF. MELDOLA in his letter (*NATURE*, February 1, p. 447) refers to a similar occurrence to that described by me in *NATURE* of January 25, and he says, "it must, I think, have been in 1866 or 1867." Prof. Meldola adds that there must be many Londoners now living who can remember the occasion.

I well remember the occurrence, and my brother, Mr. J. S. Harding, skated round Belgrave Square and the immediate neighbourhood for two or three hours.

May I give the following extract from my Meteorological Register, kept in the neighbourhood of Belgravia, which shows the time and nature of occurrence?

"1867, January 22.—Slight rain from 7.20 p.m. to 10 p.m., half congealed before it reached the ground, and forming almost simultaneously with its fall a sheet of ice upon the earth, evidently the result of rain falling from a stratum of warm air at no great distance from the earth, and not having sufficient time to be converted from rain before reaching us."

This was the close of an exceptionally severe frost; my screen temperature on January 5 was 6.5°, the lowest I have observed, and the Greenwich reading was 6.6°.

I think some meteorologists would call the phenomenon referred to by Prof. Meldola a silver thaw; it is perhaps somewhat different in character from a glazed frost, and is a sure precursor of a thaw.

CHAS. HARDING.

THE following note is to be found amongst the "Meteorological Observations" at the end of "The Natural History of Selborne" under the title of "Frozen Sleet," and appears to be an example, and a remarkable one, of the phenomenon of "glazed frost":—

"January 20.—Mr. H.'s man says that he caught this day in a lane near Hackwood Park many rooks, which, attempting to fly, fell from the trees with their wings frozen together by the sleet, that froze as it fell. There were, he affirms, many dozen so disabled.—White."

ANDREW WATT.

Scottish Meteorological Society, Edinburgh,
February 10.

ON Monday, February 5, I was in Bruges; about 8.15 p.m. I heard what I thought was hail beating upon the window panes. On leaving the house about fifteen minutes later I found that everything was covered with a film of ice at least a quarter of an inch thick. The phenomenon of "glazed frost" was very well marked, particularly upon the iron railings which run along the side of the canals, and upon the twigs of the trees. The stone cobbles with which the streets are paved were completely covered with smooth ice, and the roads were almost impassable; I saw five people fall down in as many minutes.

336 Belgrave Road, Birmingham.

FRANCIS G. BELTON.

THE letters of Mr. Harding (*NATURE*, p. 414) and Prof. Meldola (*NATURE*, p. 447) recall the following:—

On February 5, about 7.30 p.m., a heavy shower of rain, which lasted for fifteen minutes or so, suddenly fell.

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Being caught in this shower, naturally I hurried, but quickly found myself slipping rather than walking along, since as soon as the raindrops came in contact with the earth they apparently froze, the roadway quickly becoming covered with a coating of ice, which had a very glazed appearance. A stick which I had in my hand also became coated, and was quite "glassy" to the touch.

Although the shower was of so short a duration, the younger element of the people about at the time enjoyed themselves sliding along the Promenade and down the main street (which has a fair slope).

The temperature during the day was about 32° F., but at the time of the shower it was about 33° F.

E. WYNDHAM JEFFREYS.

University College of Wales, Aberystwyth,
February 10.

Human Eyes Shining.

WITH reference to the last paragraph in the letter by Colonel J. Herschel in *NATURE* of January 18, I have sometimes seen human eyes reflecting light in the way described, though, as indicated in the letters to *NATURE*, it is difficult to get in the right position for seeing such an occurrence. I have never tried a dark lantern. The best instance I have seen was in 1876, when I observed the light from an oil lamp inside a little girl's eyes. It was best seen when my head was between the lamp and her, and when the shadow of my head nearly came upon her eye. It appeared to be her retina that was illuminated; it was a bright orange-red, but varied in the amount of red. When my eye was nearly in the same direction as the lamp, the whole pupil was equally illuminated, but when less nearly in the same direction the side of the pupil next my shadow was the brightest, or the only part illuminated. The illumination was stronger when she looked to one side of the lamp than when she looked at it. Her sister exhibited the phenomenon less strongly, though still brightly, but her father very slightly. In the external appearance of these eyes there was nothing unusual.

I have tried to see this phenomenon in my own eyes in a looking-glass, with the sun as illuminator, but could only see a very faint illumination, very different from the above-mentioned cases.

I have never used an ophthalmoscope, but I understand that when an eye is so observed the light is red or orange.

T. W. BACKHOUSE.

West Hendon House, Sunderland, February 10.

Chalk and Ice.

I HAVE read with much interest the letter on "Chalk and Ice" in *NATURE* of February 8, as I had observed the same phenomenon on January 7 of last year.

There had been heavy rain all the previous day and a sharp frost at night, when, in walking over Ballard Down from Swanage to Studland, in the early morning, I noticed lumps of chalk with fibrous masses of ice adhering, the ice in some cases being larger than the chalk fragment.

The soil consisted of sandy clay resting on the dip slope of the chalk, and fragments of the latter were very numerous, each with its adherent ice, which, on account of its prismatic structure, sparkled in the sunlight with bright flashes of colour, the effect being very beautiful.

The formation of ice below the surface, as suggested, is interesting, as it would certainly be an important factor in the gravitation of soil on a chalk slope during cold periods.

R. W. POCKOCK.

28 Blomfield Road, W., February 9.

Candlemas Day.

IN addition to the proverbs about the weather on the second of February quoted among the Notes in last week's *NATURE*, allow me to give the following, which was told to me by the late Dr. Corrie, Master of Jesus College, Cambridge:—

"Si sol splendescat Maria purificante,
Majus erit frigus post festam quam fuit ante."

O. FISHER.