

alongside. In dead calm, few birds leave the ferry slips for the trip, and these labor heavily across in flapping procession.

From observation of land birds I have but one note of interest. It relates to the repeatedly observed feat of a small hawk. In this instance there is no advance in any direction. Like the humming-bird he stands poised, without visible support, at a point in space; but his outspread wings and tail are as steadily held as if wired into place by the taxidermist. He points straight into the wind. If he utilizes its shifting "internal forces," he draws upon them, with extraordinary expertness, for a constantly recomposed resultant, to be maintained equal, and vertically opposed, to the pull of gravity. With almost the suddenness of the humming-bird, he will dart from one fixed position to another, seemingly by expenditure of will power only. I believe that it is high winds alone that afford him this sport, or opportunity. And I have never seen him thus poised over level ground, but among hills, even with their summits, and from one to another, close in their lee, like the humming-bird, again, in a garden. On two occasions I have had a fine chance at this skilled aeronaut, from surveying stations on hill tops. I have been able to keep him for several minutes on the cross-hairs of my telescope. As with the sailing gull, there is the same calm eye and the same quick and delicate teetering of the wings; but the individual feathers, excepting at their strongly up-bent tips, exhibit no blur of continuous motion.

If my opinion in regard to such observations as these be correct, Mr. Amery's assertion is disproved, and belongs to a stage of the investigation beyond which we have advanced.

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The Mining Building at Chicago.

To what Mr. G. L. English so well says in *Science* of Feb. 16, in defence of the gallery exhibits against the slurs of the anonymous article in *Science* of Feb. 2, on "The Columbian and the Centennial Expositions," I wish to add a word for the "ground floor." Much of the fault found by the writer of the article in question was deserved, but if he had looked for points of merit as well as of demerit he would readily have found them. The exhibit of New South Wales was wonderful for its extent, variety and completeness. It was a strictly economic display but not without scientific features as well. Everything in it was plainly numbered and labeled, and full descriptive catalogues with corresponding numbers were to be had freely on application. The Canadian Geological Survey made a very complete display of rocks, minerals and ores, in which specimens and groups were carefully arranged and plainly labeled, but the Canadians made an excellent showing at the Centennial and might therefore have been excluded from the comparison by this anonymous correspondent. Pennsylvania, New York and Michigan made displays of their great specialties of production, which were well mounted and cased where necessary and were plainly labeled. New York's geological obelisk was certainly of greater educational than technical value, while the needle of Pennsylvania anthracite coal representing the exact section of a single bed was instructive as well as impressive. North Carolina, New Jersey and Missouri aimed to have their exhibits of direct educational and scientific as well as economic value. New Jersey took especial pains to have her ores, minerals, clays and marls distinctly labeled and to put the labels where they could not be overlooked, while a complete

series of the geological maps of the State adorned the walls of the space assigned to her. The Missouri exhibit was labeled with the common as well as the scientific name and the chemical composition of each group of minerals or ores represented, in addition to the printed and written labels on each specimen. About 75 framed maps, charts, diagrams and photographs were displayed in this exhibit each of which bore an adequately descriptive label. The "great piles" of ore and metal here had a definite meaning, which was plainly stated on a large label prominently placed. I might go on and mention many points of excellence in other exhibits on the ground floor, without going into details as to the instructive array of mining, milling and quarrying machinery on exhibition, but I have said enough to show that there were more than "one or two" exceptions to this correspondent's strictures. The general public seems, indeed, to care more for the Ada Rehan statue than it did for education in mining, mineralogy, or geology, but that is not the fault of the exhibitors who strove to instruct as well as to interest those who strayed into their spaces in the Mining Building, and I quite agree with Mr. English in thinking that the mining exhibit at Chicago far exceeded that at Philadelphia in every respect, though of course any one at all versed in the matter could detect many defects which might have been remedied.

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New York, March 1.

Petrified Eyes.

IN *Science* of Feb. 2 Mr. Geo. G. Groff, under the title of "Petrified Eyes," calls attention to a statement in some popular school geology that "huge saucer eyes," of a thirty-foot monster, were so perfectly petrified that the "lenses have been split off and used as magnifiers."

About a hundred years ago some students of Palæontology, at Heidelberg, made to represent fossils, out of clay, spiders in their webs, snails with antennæ perfectly preserved, a plump mouse, and other similar things, and left them where they could be found on class excursions. The professor described and pictured them in a book as remarkable fossils. On a latter excursion he found his name fossilized. He gradually realized that he had been hoaxed, and chagrin hastened his death.

Ever since then it has been established that only chitinous, horny, or bony parts of an animal are petrified; soft parts are never petrified. They may leave impressions in a fine soft mud, as the examples of jelly-fish in the Solenhofen—Bavaria—stone so well show. The outlines of the body of worms, fish, reptiles, mammals, are preserved by the shaping of the mud in which they were deposited—not by the membranes themselves being chemically replaced. This is true even of the tougher membranes of the body, as for instance the hide, and much more so with any part as delicate as the crystalline lense. The ease with which the lense is destroyed is shown by one of the three methods employed in treating cataract of the eye, where by means of needles the lense is broken up and is finally absorbed by the fluid in the anterior of the eyeball.

Quarrymen seem to delight in finding "fossil eyes," as they name many things from the teeth of *Gyrodus* to quartz boulders.

While the lense could not be petrified, the bony eye cavity, or the cavity formed by the sclerotic ring possessed by many fishes and reptiles (e.g., *Porteus*, *Ichthyosaurus*) could be filled with gypsum, calcite, or quartz in such a manner as to furnish a plano-convex lense.

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