below its digestive tract) has become transformed into the backboned nervous belongings. There is, however, the big liver of the ancestor to be reckoned with. Where has it gone to in the course of the transformation? In the young lamprey it is shown that a kind of temporary liver may be regarded as existing in the brain, and this is looked upon as the rudiment or remnant of the liver which was once the possession of the vertebrate's ancester. On the whole, it may be said, we are getting on very nicely in biological theory; and, whether we accept the views thus set forth or not, we may at least feel some curiosity in knowing how modern speculation is deriving the vertebrates from lower forms, and how the modern backboned animal is thought actually to carry in its spinal cord the remnant of the ancestral digestive system.

NOTES AND NEWS.

THE Hon. C. B. Farwell of Chicago received a telegram on Aug. 11 from Professor Dyhrenfurth, in charge of the rain-producing experiments provided for by the last Congress, now being conducted on the ranch of Nelson Morris, in Texas. The professor says that the first experiment was made on the 10th, powder being exploded high in the air; and that it rained heavily there on the 11th.

— Mr. F. Howard Collins, the author of a useful epitome of Mr. Herbert Spencer's system of philosophy, has written a pamphlet in which he discusses the causes of the diminution of the jaw in the civilized races. In opposition to the views of Weismann, says *Nature*, he contends that the phenomenon is due to disuse.

— A recent issue of *Nature*, quoting from *Das Wetter* for July, reports a curious case of globular lightning which occurred at Berga, near Schlieben, in Germany, between 3 and 4 o'clock on the morning of July 1. The lightning entered the chimney and split into two parts, one portion running along the rafters of the roof, and the other entering a bed-room occupied by a man and his wife and three children. The man, who was up, on account of the violence of the storm, saw the ball jump on to the bedstead, which it broke, and from there it slowly travelled to the opposite side of the room, and disappeared, with a loud crash, through the wall. None of the occupants were injured, further than being deafened for a short time.

— The Vienna correspondent of the London *News*, recalling that paper's description of the Roman remains at Hainburg, about twenty-four miles from Vienna, on the site of the ancient Roman frontier town of Carnuntum, on their discovery a year or two ago, says that new excavations are now taking place in the immediate neighborhood of the Castle of Petronell, the residence of the Counts of Abendsberg Traun, which is about two miles distant from Hainburg, and have resulted in the discovery of many interesting architectural remains and much sculpture. These discoveries lead to the conclusion that Carnuntum must have been a much larger town than was thought, for it seems that it must have contained several hundred thousand inhabitants.

— It is the fashion to write articles on theories of rest and how to obtain it, says the *Illustrated American*. Anna Brackett contributes an admirable paper, entitled "The Technique of Rest," wherein she sets forth the possibilities of absolute rest, both mental and physical, under difficult circumstances. The celebrated Dr. Hammond has also given some very erudite and practical views of the same theme. It would be well for the rushing, hurrying, scurrying, never-resting crowd of workers to stop a moment and listen to such notes of solemn warning; and, at least in the choice of "recreations," to select such diversions as will tend to create exhausted vitality, and not add fresh fuel to a consuming fire. Dr. Hammond lays some stress on the trite truth that rest is often but a change of work. The athlete may rest over a game of chess or whist. The brain-worker of sedentary habit who concentrates a weary mind upon an intricate game which demands unremitting alertness of attention is diverting from his chosen calling just so much mental vigor, — exactly, to an atom, so much vital power. Let those men and women who are thinking for a living stop thinking, as a conscious effort, when they would rest. If she who would plan her life wisely will make a careful estimate of the comparative values of those things which enter into it only by her own consent, offsetting them in the inventory by those demands which are essential, she will draw a pencil through every diversion which is akin to her life-work. If she is a wise journalist or literary woman, she will eschew whist as a wary thief of her powers, whose dangers are even enhanced by her mental habit of self-surrender and concentration.

— Professor Tito Martini of Venice contributes to the issue of the *Rivista Scientifico-Industriale* for the end of June, the results of some experiments on the crystallization of thin liquid films. He finds, according to *Nature*, that a strong solution of sodium sulphate, when cooled to near its saturation point, possesses a viscous character which enables it to form a thin film on a metallic ring, as in Mr. Boys's experiments with soap-bubbles. On rapid evaporation such a film crystallizes to an extremely beautiful open lattice-work of minute crystals, which preserve their transparency for some time, and then effloresce and crumble to powder. The experiments succeeded with rings up to thirty-six millimetres diameter. Similar experiments with ammonium chloride and sodium hyposulphite have hitherto proved unsuccessful. With a transparent film of liquid sulphur, however, even more beautiful results have been obtained. The author regards such experiments, besides being eminently suitable for lecture demonstration, as likely to throw light on the nature of molecular arrangement in relation to crystallization.

— During the last two centuries, says the *Scottish Geographical Magazine*, the Lapps of Norway have been moving gradually southwards, preserving their uncivilized and nomadic mode of life in their new environment. Dr. Yngar Nielsen of Christiania has recently studied this interesting ethnological question (Le Tour du Monde, Nouvelles Géog., p. 137). According to him the southern limit of this people is now marked by the railway from Trondhjem to Östersund, nearly along the 63d parallel of north latitude. To the north of this line are found ancient tombs, places of worship, and names of Lappish origin. Here the Lapps of the present day, though nominally converted to Christianity, retain in secret some of their pagan customs, whereas further south they are good Christians, and have changed even in type. About the year 1600 the southern limit of the Lapps was on the parallel of the northern extremity of the fiord of Trondheim; since then they have made several excursions southward, and have been repeatedly checked by the Norwegian Government. In 1890 they advanced as far as the plateaus of the Hardanger Fjeld. The Norwegians do not resert to violence, but defend their property by legal processes. The question of the Lapp invasion is, however, one that demands the serious attention of the Government.

— In a paper on "Some aspects of Acclimatization in New Zealand," read before the Australasian Association at its Christchurch meeting by Mr. G. M. Thomson, the following remarkable case of hereditary transmission of an apparently defective characteristic was described (New Zealand *Journal of Science*, July). In the district of Strath Taieri, in Otago, some years ago, certain sheep on one of the runs, probably the progeny of a single ram, were found to be evidently short-winded. Apparently the action of the heart was defective, for when these sheep were driven, they would run with the rest of the flock for a short distance and then lie down panting. The result of this peculiar affection was that at nearly every mustering these short-winded sheep used to be left behind, being unable to be driven with the rest. Sometimes they were brought on more slowly afterwards, but if it happened to be shearing time they were simply caught and shorn where they lay. As a result of this peculiar condition a form of artificial selection was set up, the vigorous sheep being constantly drafted away for sale, etc., while this defective strain increased with great rapidity throughout the district, for whenever the mobs were mustered for the market, shearing, or drafting, these "cranky" sheep (as they came to be called) were left behind This defective character appeared in every succeeding generation, and seemed to increase in force, reminding one of the Ancon sheep referred to by Darwin. At first, of course, the character was not recognized as "hereditary," but as the members of this cranky breed increased to a very

serious extent and spread over the district, it came at last to be recognized as a local variety. When the runs, on which these sheep were abundant, were cut up and sold or re-leased in smaller areas a few years ago, the purchasers found it necessary for the protection of their own interests to exterminate the variety, of which hundreds were found straggling over the country. This was easily and effectually done in the following manner. As soon as a sheep was observed it was pursued, but after running for a couple of hundred yards at a great rate of speed, it would drop down panting behind a big stone or other shelter, and seemed incapable for a time of rising and renewing its flight. It was immediately destroyed, and in this manner a useless, but to the naturalist a very interesting, variety was eliminated.

— M. Paul Barré contributes to the *Revue Française* (April 15, 1891) a short paper on trans-asiatic journeys, from which the *Scottish Geographical Magazine* extracts the following. The Dutchman Ruysbroeck visited Mongolia between 1246 and 1273, but, though he advanced far towards the east, he did not succeed in reaching the Chinese coast. The first European to traverse the whole continent was Marco Polo (1271–1295), who, passing through Turkestan and China, entered Pekin, and extended his journey even to Japan. Irmak Timofeef, a Cossack brigand, opened Siberia to Muscovite influence (1530); and Elisée Bouza (1635), Kopylof (1639), and Sladukhim and Ignatief (1644) succeeded in reaching the north-western limits of this country. Dejnef, in 1648, reached the Gulf of Anadir, and ascertained the existence of a strait between Siberia and America before Behring sailed to that region. Again, Baikof crossed Mongolia in 1654, and entered Pekin as ambassador of the Czar. From this time Russian explorers in Siberia became very numerous, but no one followed in the track of Marco Polo until quite recently. Ney Elias crossed Central Asia in 1872–73; M'Carthy travelled from Shanghai to Bhamo in 1876-73, and thence to the coast; Joseph Martin has crossed Siberia twice; Benoist Méchin and Mailly Chalon journeyed from the Ussuri to Bohkara and Merv; and Przhevalski penetrated as far eastwards as the sources of the Whang-ho. Still more recently (1889) Younghusband traversed Central Asia from Pekin to India, and Bonvalot (1889–90) passed from Siberia through Thibet to southern China.

— On Aug. 13 Gen. Greely sailed for Munich, to attend a meeting of the International Polar Commission. Gen. Greely has been ordered by the War Department to attend this meeting, which is the fourth and final session of the commission, and which completes his work in connection with arctic exploration and scientific investigation of the physics of the polar regions. At this meeting the commission will consider the final scientific treatment of the volumes of physical observations published by the Governments which sent out the expeditions of 1881 to 1883. No less than eleven nations will be represented at Munich. Gen. Greely is the only representative from the United States, having been unanimously elected by the other members of the commission. Gen. Greely, in addition to urging on the commission the general discussion of arctic meteorology, will present to the members a scheme of general treatment for the magnetic observations and results of the studies and investigations of Professor Bigelow of the Nautical Almanac office of the Navy Department. This line of treatment is original, and as it is indorsed by Professor C. A. Schott of the coast survey, the acknowledged authority in this country on magnetics, it is believed that it will be interesting to the scientific world when fully developed.

— The use of the detersive effect of a stream of water, says *Engineering*, has been very general in what is known as hydraulic mining in the western part of the United States, where hills of gold-bearing earth have been washed away by very powerful streams conveyed from elevated sources of water supply in the mountains, the gold being afterwards found in more concentrated form deposited in the valley at points where the current was rapid enough to bear away the earth: but the deposits of earth on the arable lands in the valley below have been so destructive to grazing land that stringent legislation has been necessary to prevent the continuance of this practice in many portions of the country. Recently, however, there has been an application of the same practice, but for a reversed purpose, and that is on a railway line in the State of Michigan, where an available supply of water was used to wash down gravel deposits among trestles or timber viaducts along the line of the road, and in that manner to deposit gravel in such a way as to fill up a solid embankment to the line of the track. By guiding these movable sluiceways and also altering their slope or the supply of the water, the direction and velocity was controlled so as to accomplish the result in a very cheap manner, the expense of such filling being about three cents per cubic yard. At Scranton, Penn., there are numerous piles of anthracite culm in the vicinity of the coal breakers over the pit's mouth at the mines, and recently this material has been put to considerable use under boilers, as people are allowed to take it away at a cost of ten cents per ton. An electric light and power station has been built near one of these culm piles, and the coal taken from the pile to the fire-room by means of a stream of water and a sluiceway. Just outside of the delivery in the fire-room the bottom of the sluiceway is perforated so that the water can pass away, and the fuel is delivered at the fire-room in a reasonably dry condition, as the water passes away from it readily. When the low cost of the fuel and slight expense of its transportation is considered, it is held that the amount of moisture in the fuel is merely an item of lesser expense in comparison with other means of delivery.

— The London *Times* of May 20 gives a melancholy account of the Coreans, extracted from a Japanese paper. An evil genius, says the correspondent, seems brooding over the life of the Corean people, paralyzing every nerve and muscle. This evil genius seems to be nothing else than a wretched system of government, or, rather, the absence of anything deserving the name of government. The aristocracy, by unjust taxation, persecution, and violence, extort from the agricultural population the small surplus of their earnings which remains after their absolute necessities are satisfied. Consequently the villages have a desolate appearance, the roads are execrable, and stagnation prevails throughout the country. Yet the peninsula is remarkably rich in natural products. The gold deposits must be of value, for, even now, gold-dust to the value of about £500,000 is exported yearly. There are rich mines of anthracite in the north, and iron, copper, and lead await the miner and manufacturer. But as long as abject poverty is a man's sole protection the country cannot make progress.

— An interesting article on the utilization of waste products in relation to breweries, in the *Brewers' Guardian* (English), calls attention to the utilization of the carbonic acid gas produced in the fermentation of sugar. On an average, English beer may be considered to contain 5 per cent of alcohol, and as, in the fermentation of sugar, the weight of carbonic acid produced is almost the same as that of alcohol (the exact proportions being 48.9 of carbonic acid to 51.1 of alcohol), there must have been 500,000,000 pounds of carbonic acid produced in our breweries. The specific gravity of carbonic acid is 0.1524, and therefore a simple calculation shows that the above weight is equal to 25,000,000,000 gallons — a volume it is almost impossible to realize. Such a volume would require a space one mile square and forty yards high to contain it. It is now proposed to utilize the greater portion of this large quantity of carbonic acid. The process by which this is to be done has been tried for some little time past in St. James's Gate brewery, Dublin; and Sir Charles A. Cameron has reported very favorably on it. The following are the conclusions at which he arrives after a most careful examination of the process: (1) An immense quantity of carbonic acid is produced in breweries, and is at present wasted; (2) a large proportion of this gas could be condensed to liquid at a cost not exceeding ½d. per pound, but probably less than ¼d. per pound; (3) the process of liquefying the gas is successfully carried on at Guinness's brewery, Dublin; (4) the liquefied gas prepared at Guinness's brewery is perfectly free from any peculiarity of flavor or odor; (5) the carbonic acid produced at soda-water works costs about 4d. per pound; (6) it is safer, and in every way more desirable, to use in beverages carbonic acid derived from a food substance, such as grain, than from mineral sources; (7) the uses of liquid carbonic acid are numerous, important, and increasing.