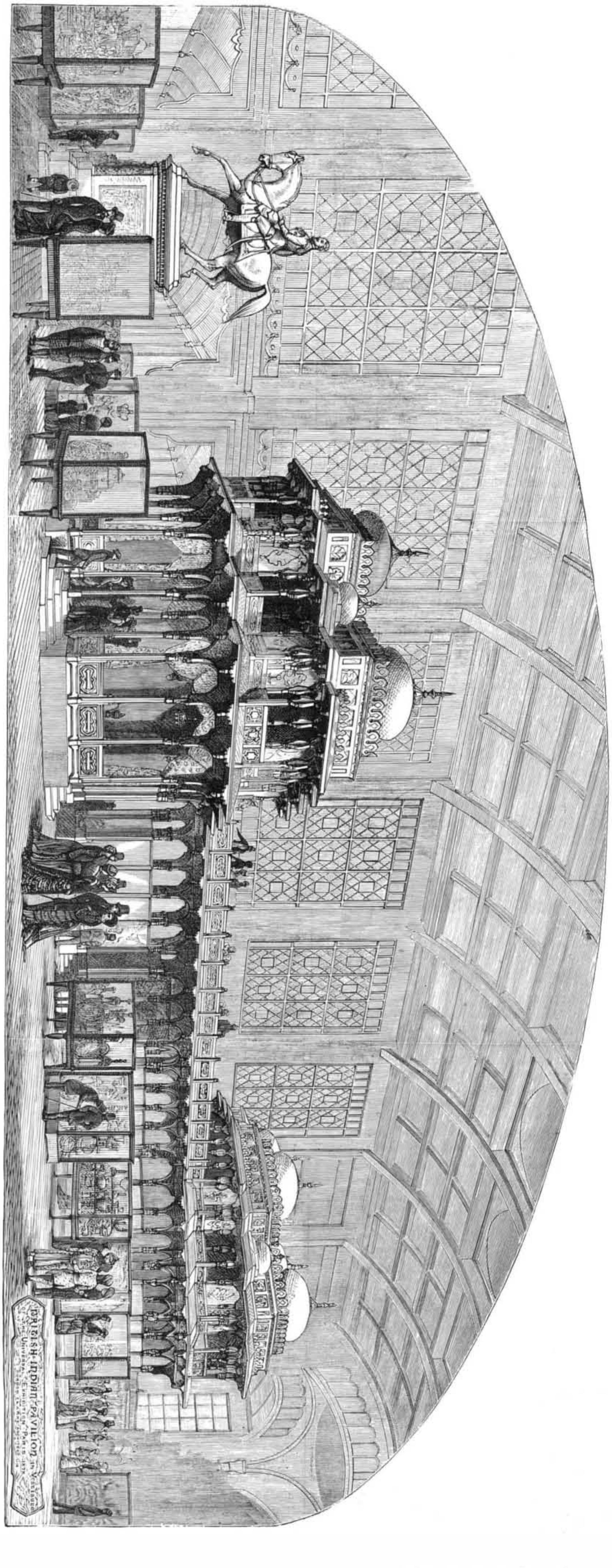


THE BRITISH INDIAN SECTION AT THE PARIS EXPOSITION.

THE BRITISH INDIAN EXHIBIT.

The main building of the Paris Exhibition is divided longitudinally into two sections, of which the eastern portion appertains to France, and the western to foreign countries. More than one fourth of this latter space is occupied by England and her colonies, British India being especially conspicuous. An interior view of the section appropriated for its exhibit we copy from the London *Graphic*. The greater part of the space is devoted to the display of the fine collection made by the Prince of Wales during his Eastern travels, and this collection will undoubtedly be one of the prominent features of the exhibition. His Royal Highness is described by the English press as being deeply interested in the work of rendering the exhibit under his charge as successful as possible.

Probable Iron Mines in Syria.

Professor Osborn, of Oxford, Ohio, has recently been examining some iron ore from the Lebanon Mountains of Western Syria, with these results:

"Among other minerals, a specimen of supposed iron ore has been brought from near the foot of a prominent Lebanon peak, well known to tourists as Jebel Keneiseh. The locality, as described to me by the finder, is on the French road from Beirut to Damascus, twelve miles east of Beirut. The specimen is not a good ore, and rather lean, containing only about twenty per cent of iron, and very silicious. But to me the specimen is suggestive. There must be a genuine ore somewhere in that region. This specimen is not an oxidized result of some nodule or mass of sulphide, which frequently occurs even in the blue limestone of this region and of other horizons where iron ore is not found. This is too silicious, and indicates an outcrop of magnetite or compact specular ore or red hematite. There seems, from the statement of the finder, to be a large number of fragments scattered around. I am somewhat acquainted with the country to the south, and there acres may be found covered with streaks and patches of extremely red soil, but this is the first specimen so nearly resembling iron ore that I have seen from this country.

"The particular interest associated with finding iron ore in this country is twofold. Geologically this land is Jurassic, or, of the higher horizon, Cretaceous, horizons in which it is not usual to find such ores as the ancients used from which to make iron, ores which were exclusively rich. Elba has no Jurassic formation, and its iron comes from Porto Ferraio, in a strictly plutonic region. Moreover, this land, historically, was spoken of as one from which iron could be taken, an assertion not yet verified. A discovery of true ore here would be scientifically and historically interesting, and I would suggest to tourists this summer to examine the region to the north and east of the locality above indicated for a true magnetite or specular ore (red), using the brown hematite specimens only as indications."

Grape Culture.

The following brief, practical, and condensed rules for the management of grapes were given by Dr. Whiting at the Farmers' Institute, recently held at Saginaw, Mich.:

The soil best suited for the grape is decomposing shale, but any good clay soil thoroughly drained will do.

The ground should be carefully prepared, and only well rotted manure used.

Decomposing turf is one of the best fertilizers; when it can be obtained, no other will be required.

The vines selected for planting should be good one year old layers or cuttings. They may look small, but will make the best vines.

Good culture is as necessary to the vine as to corn or cabbage.

Mulching and watering the first year should not be neglected if drought is excessive. One good soaking is better than many sprinklings. More water can be saved with a hoe than can be put on with a sprinkler.

In planting cut the vine back to two buds, whatever its strength or age.

Summer pruning consists in pinching off weak and straggling shoots in order to confine the sap to the main branches.

The first summer allow but one main shoot to grow. In the fall, after the first frost, cut all the summer growth back to within two buds of the ground.

The second year confine the sap to two branches, and in the fall cut back to three buds each.

The third year, if your vine has made vigorous growth, a few stems of grapes may be allowed to mature, but better take off all the fruit than to suffer too much to grow.

Too heavy bearing while young will weaken the vine for all future time. The trimming now depends on what kind of trellis you wish to cover.

After you have obtained a good vigorous root, you can make it grow in almost any place or shape you wish, by keeping the branches desired tied up, and all the others pinched back.

Each year a few of the strongest branches should be allowed to grow as bearers of fruit the following year.

In trimming cut away as much of the old wood as possible and save the new, as all the fruit buds are on the new wood.

You can easily tell how much to cut away by holding your new wood up to the trellis, and imagine a branch with three stems of grapes for each bud.

If you do not cut off enough in the fall, and you find that the vine is going to be too thick, do not fail to attend to it when the new shoots are from three to six inches long, in the spring, or while in blossom. As soon as the fruit is set examine the vine; spread out the new wood so that each bunch of grapes will hang free and clear; pick off all the small stems of fruit, and fasten the vines securely, so that the wind will not destroy your crop by breaking the young and tender branches.

When the wood has grown so that there are three leaves beyond the last bunch of grapes examine the vine, select the branches you wish to save for fruit bearing the coming year, and keep them tied up until they have grown as long as you wish to make use of. The ends of the other bearing branches should be pinched off as soon as they reach this point, "three leaves beyond the last stem of grapes."

Break off all shoots and laterals as fast as they make their appearance, but on no account injure the leaves on the bearing canes.

The fruit will color but not ripen if the leaves are destroyed.

Grapes for fall and winter use should be picked as soon as ripe, and when perfectly dry, packed in fine dry sawdust. Select your box or jar, cover the bottom with sawdust, then layers of grapes and sawdust alternately until full. Keep them in the coolest place you can find free from frost, until wanted for use.

THE PRODUCTION OF ARTIFICIAL MONSTERS.

It is well known that both animals and plants often yield progeny of strange and abnormal form, sometimes changing the whole aspect of the offspring, at others appearing as greater or less deformities. "Sports," "freaks of nature," "monsters," and like names are popularly applied to these phenomena, despite the fact that science has succeeded in reducing certain types under definite laws. Most commonly

Fig. 1.

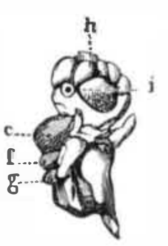
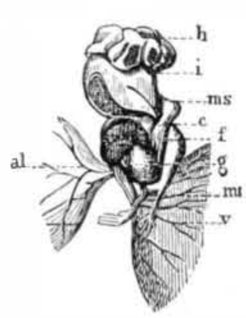


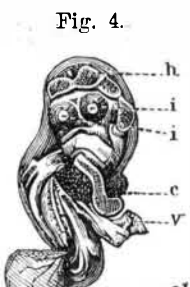
Fig. 2.



these organisms are sterile, but there are instances where they reproduce their kind and become a species. Geoffroy St. Hilaire, who perhaps made the deepest investigations ever conducted into the nature and causes of their production, first conceived the idea of artificially producing them, and to this end he began modifications of the physical conditions of the evolution of the chicken during natural and artificial incubation. He determined the fact that monsters could be produced in this way, but scarcely carried his investigation further. This work has been taken up by M. Dareste, and he has lately published a volume in Paris which recounts the results of a quarter of a century's experimenting. Eggs, he states, were submitted to incubation in a vertical instead of in a horizontal position; they were covered with varnish in certain places so as to stop or modify evaporation and respiration. The evolution of the chick was rendered slower by a temperature below that of the normal heat of incubation. Finally, eggs were warmed only at one point, so that the young animal, during development, was submitted at different parts to variable temperatures.

Fig. 3.

Fig. 4.

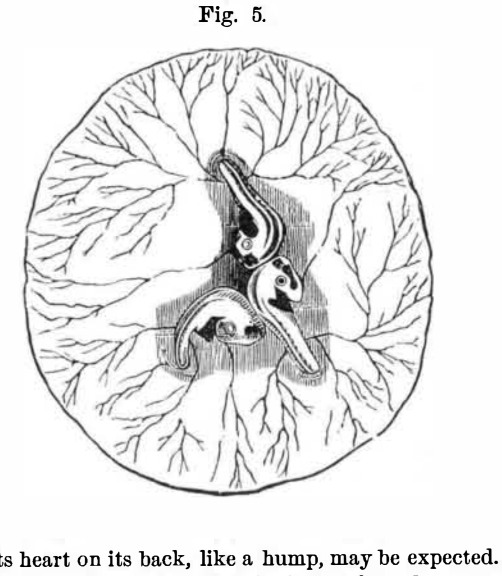


These perturbations resulted in the most curious and unlooked for deformities in the embryo, some being not alone peculiar to the bird, but being similar to those which have been recognized in many other animals, and even in the human species. The data obtained have been deemed so important that M. Dareste has recently received the Lacaze prize for physiology from the French Academy of Sciences.

It would be impossible, in the limited space at our disposal, to review even a fraction of the many forms of monstrosities which M. Dareste has discovered. Those that we give will, however, suffice to convey an idea of the wonderful variations produced. Fig. 1 is a chick embryo, with the encephalon entirely outside the head, the heart, liver, and gizzard outside the umbilical opening, right wing lifted up beside the head, and the development of the left one stopped. In Fig. 2 the encephalon is herniated and marked with blood spots, the eye is rudimentary and replaced by a spot of pigment, the upper beak is shorter than the lower one, while the heart, liver, etc., are all outside. In Figs. 3 and 4 the head is compressed, eyes well developed, but in the back instead of in the sides of the head; the body is bent, abdominal intestines not closed, heart largely developed and herniated. The literal references to the foregoing are: *am*, amnion; *al*, allantois; *v*, vitellus; *h*, encephalon; *i*, eye; *c*, heart; *f*, liver; *g*, gizzard; *ms*, upper, and *mi*, lower member.

The commonest case of monstrosity observed by M. Dareste has been that of the head protruding from the navel, and the heart or hearts above the head. This is a most extraordinary and new monster, and, if it persist, a chicken

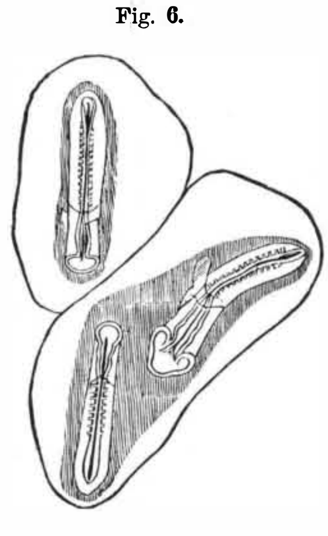
Fig. 5.



with its heart on its back, like a hump, may be expected. A curious fact discovered is the duplicity of the heart at the beginning of incubation, two hearts, beating separately, being clearly seen. Another anomaly consists in heads with a frontal swelling, which is filled by the cerebral hemispheres.

M. Dareste's artificial monsters are all produced from the single germ or cicatricule (as the white circular spot seen in the yellow of the egg, and from which the embryo springs, is termed). He has not yet been able to determine artificially the production of monsters, the origin of which takes place in a peculiar state of the cicatricule before incubation. But having submitted to incubation some 10,000 eggs he has obtained several remarkable examples of double monstrosities

Fig. 6.



in process of formation, some representations of which are given herewith. Fig. 5 shows three embryos, all derived from a single cicatricule. Fig. 6 represents three embryos from two cicatricules. On one side of the line of junction are two imperfectly developed embryos, one having no heart. The single embryo on the other side is generally normal, but has a heart on the right side. In Fig. 7 are twins, one well formed, the heart circulating colorless blood, the other having no heart and a rudimentary head. Fig. 8 exhibits a double monster with lateral union. The heads are separate, and there are three upper and three lower members, those of the latter on the median line belonging equally to each of the pair.

Fig. 7.

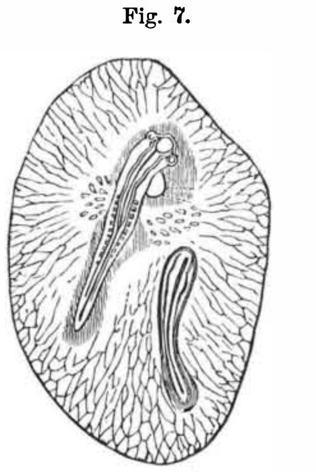


Fig. 8.

M. Dareste's work embodies a general theory of these singular organisms, which, it is believed, will be of much value to embryological science.

New Investigations on Glucinium.

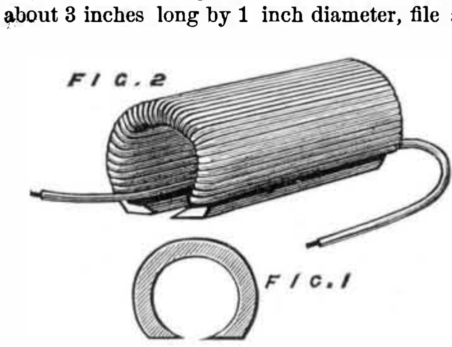
MM. Nilson and Petersson communicate to the French Academy of Sciences the following results of their late investigations into the physical properties and specific heat of glucinium: The metal is grayish, and of about the color of steel or tin. It is very light, has a density of 1·901 at 32° Fah., is hard, has a great tendency to crystallize, and when cast in globules breaks easily under the hammer. It does not fuse at temperatures at which sea salt easily melts, and is not altered by exposure to the air. It is unalterable by oxygen when at a red heat or by sulphur vapor. In the oxidizing flame it becomes covered with an oxide film, with no phenomena of ignition. It has no action on water, hot or cold. Hydrochloric and hydrosulphuric acids and hydrates of potash and soda are decomposed by it. It disengages hydrogen rapidly when heated. Nitric acid attacks it slowly, a small residue of silicic acid with a little iron and glucine resulting. The density of the impure metal has been determined at 1·9101. The specific heat averages 0·4084.

A Possible New Force in the Solar Rays.

M. Forssman, who has been making investigations on the action of variously colored lights on the galvanic conductivity of selenium, concludes that it is not the light vibrations or certain kinds of them that produce variations of conductive resistance, but vibrations of another order which he thinks have neither lighting, heating, nor chemical action. This opens the road to further researches to discover whether this hypothesis be true, as, if so, its verification would be of the highest scientific importance, and amount practically to the revelation of a new mode of motion.

How to make a Strong Electro-Magnet.

To make a Jamin magnet, take a piece of wrought iron pipe about 3 inches long by 1 inch diameter, file away one



side until through (see Fig. 1), and then, after softening it in fire, wind with cotton-covered wire in the direction of its length, as in Fig. 2. It is superior to the ordinary form of magnet in its great power, arising from several causes. The poles are close to one another, and have large surfaces, and, from their proximity, the part of the wire in the interior of the tube reacts on both poles, thus utilizing the battery power to the full.

A Salmon Disease.

A remarkable fatality has befallen the salmon in the rivers of Cumberland and Westmoreland, England. A short time ago large numbers of salmon were found dead on the banks or floating on the surface of the river Kent, and, though poisoning was suspected, the river watchers have been unable to find any trace of pollution, either willful or accidental. In most cases it was found that the fish were "kelts" or spawned fish, which had, as is frequently the case, succumbed to the effects of exhaustion after spawning; but the great number of fish dying in this way at one time was very remarkable. In the Eden, however, a more serious state of affairs exists. Large numbers of salmon—not only kelts, but clean fish lately arrived from the sea—appear to be affected with an epidemic which destroys hundreds of them. The head and tail first, and gradually the whole body, is attacked by a disease which appears to eat away the flesh, turning it white, and giving the fish the appearance of being affected with leprosy. Such fish are entirely unfit for food. Correspondents describe them as leaping out of the water, as if in pain, and in frantic efforts to escape; some return to the sea, but many perish in their attempts to reach the salt water. The salmon caught in the estuary are not diseased in this way, and, as the epidemic is said to be spreading to the trout, it would appear that some peculiar condition in the fresh water is the cause of the remarkable phenomena.

Improved Rolls for Beams.

Mr. Josef F. De Buigne, of Vienna, Austria, has recently patented a new method of grooving rolls, so that the groove forming the web of the beam or bar shall form an obtuse angle with the axis of the roll and with grooves which make the flanges. By this arrangement a vertical pressure is exerted at each pass at the same time upon the web and upon two of the opposite flanges, so that any desired sectional shape may be made by the use of horizontal rolls, only independent of the relative dimensions of flanges and web. The patent is offered for sale by Messrs. Wirth & Co., of Frankfort-on-the-Main, Germany.

A New Explosive.—Professor Emerson Reynolds suggests a compound of 75 parts chlorate of potash and 25 parts sulphurea (a substance obtained from a waste product of gas manufacture), the ingredients to be mixed as required at the time of using.