

ARALIACEÆ.—(*The Ivy Family.*) A family of some forty genera and about four hundred species, widely distributed through temperate and tropical regions of both the old and the new worlds. Its plants are highly ornamental, some, like the ivy, being extensively cultivated for this purpose. Medicinally, it is of note as yielding the famous ginseng. Its constituents are simply aromatic and without special properties. The spikenard, and several other species of aralia, were formerly very extensively used, and are still used to a considerable extent, for these properties. Some of them contain amaroïds in connection with their resins and volatile oils.

H. H. Rusby.

ARBOR VITÆ.—(*Thuja.* The fresh tops of *Thuja occidentalis* L., Fam. *Coniferae*.) This is a North American tree, growing abundantly in Canada and the Northern States, and extending at higher elevations as far south as Pennsylvania and Virginia. It is a middling or good-sized evergreen tree with spreading and graceful branches, and a fine, often large, trunk, which supplies a close-grained, durable wood. It is occasionally planted here for ornament, but more often abroad, where it is valued as a garden tree; the *Arbor vita* of our gardens is usually the smaller, closer, erect-branching *Thuja orientalis* Linn. of Asia, which is a favorite hedge plant. The genus to which these belong is a small one of only a dozen species.

The twigs were thus described in the Pharmacopœia, edition of 1880: "Twigs flattish, two-edged, the scale-like leaves appressed and closely imbricate in four rows, rhombic-ovate, obtusely pointed, with a roundish gland upon the back; of a balsamic, somewhat terebinthinate odor, and a pungently aromatic, camphoraceous, and bitter taste."

Arbor vitæ contains about one per cent. of a volatile oil, something like that of juniper; tannic acid (pinitannic); a minute amount of a glucoside called *thujin*, etc.

MEDICAL PROPERTIES.—Astringent, diuretic, expectorant, tonic, etc., in no direction of much value. Some times used for cough; a tincture is employed occasionally for external use upon ulcers, rheumatic joints, etc. Dose, 2 to 4 gm. An alcoholic fluid extract would be a suitable preparation.

W. P. Bolles.

ARCACHON.—The town of Arcachon lies about thirty miles southwest of Bordeaux, on the margin of a very extensive salt-water lake, and some ten miles back from the Atlantic coast. The modern origin of the town is indicated by the motto inscribed upon its coat-of-arms, *Heri solitudo, hodie pagus, cras civitas*; which motto is also an indication of the former character of the surrounding country. A desert waste of barren sand dunes extended for many miles in every direction about the present site of Arcachon, until the French Government, some fifty years ago, conceived the project of planting these dunes with pine forests, as a means of immobilizing the sand which, driven by the fury of the Atlantic gales, was continually encroaching more and more upon the country of the interior. A thick forest of these trees (*Pinus maritima*) now covers the whole face of the country, and by these pine-covered sand hills the site selected (in 1854) for the now well-known sea-coast resort of Arcachon is shut in and protected on every side except upon the north, which is occupied by the great salt-water lake above mentioned, upon whose southern shore the town is built.

[There are nine thousand acres of these pine trees, which produce a most peculiar stillness—owing to the deep sand roads and walks not giving any sound, and the pine trees having no leaves to rustle.—*E. O. O.*]

From its close proximity to the Atlantic Ocean, Arcachon necessarily possesses a climate characterized by the moderate moisture of atmosphere, and by the equability of temperature proper to most maritime stations. The direction of the prevailing winds, which in this region blow from the ocean, is an important factor insuring to

this sea-coast station its proper maritime climate. From the direct violence of the Atlantic gales, as well as from the winds blowing from the east and south, Arcachon is sheltered by the dense pine forest which clothes the surrounding sand dunes; while the sandy nature of its soil serves in some measure to diminish the tendency to excessive atmospheric humidity which might, perhaps, be expected to exist in a region thus exposed to ocean winds.

Winds blowing from the north and from the northeast reach Arcachon after passing over its great lake or landlocked bay, the circumference of which is stated by Dr. J. H. Bennet to be sixty-eight miles in length. Such north and northeast winds, therefore, "become somewhat warmed in winter, and their irritating dryness diminished, while it is maintained that they also bring from the surface of this unusually salt sea water, and from the vast extent of sands exposed by the retreating tides, an appreciable amount of saline and other marine emanations, to give a special efficacy to the air in certain scrofulous conditions" ("Health Resorts and Their Uses," by J. Burney Yeo, M.D., p. 261). According to the author just quoted, the prevailing winds at Arcachon, namely, these sea winds blowing from the northwest, west, and southwest, occur most frequently from December to February, "usually blow continuously day and night for several days in succession . . . often blow with great violence, and were it not for the protection of the lofty pine-trees . . . would form a serious drawback to the climate." The average number of rainy days in that portion of France in which Arcachon is situated is stated by Lombard to be one hundred and thirty, while the total amount of the annual rainfall is twenty-three inches, a greater part of which falls during the winter and autumn months than during the spring and summer seasons.

The mean temperature for the year at Arcachon is 59° F.; the mean temperature of the winter season 46.4° F. to 50° F. (Lombard). At Bordeaux the mean winter temperature (according to the same author) is 43.7° F., and the mean annual temperature is 55.6°. A very pronounced difference of temperature between these two points is thus made manifest despite the trifling difference in latitude existing between them. According to data quoted from Dr. G. Hameau in the "Dictionnaire Usuel des Sciences Médicales," the result of a series of thermometric observations taken in the pine woods at Arcachon, and covering a period of ten years, showed the mean annual temperature at 8 A.M. to be 55.76° F., and at noon to be 59.96° F.; for the minimum temperatures the annual mean was found to be 46.94° F.; for the maximum temperatures it was 66.2° F.

Arcachon is both a summer and a winter resort, and there are two distinct portions of the town, the one, adapted for residence during the warmer months, lying directly on the shore of the salt-water lake or basin, and possessing facilities for bathing; the other lying away from the water in the midst of the pine forest, separated from the shore town by a high sand dune, and consisting of "numerous villa residences actually built in the forest, each house being surrounded by pine trees" (Dr. J. Burney Yeo, *op. cit.*). This latter section is known as the Ville d'Hiver, or winter town, while the former is called the Plage, or beach. Of this Plage, Dr. Yeo remarks that it is "occupied by somewhat closely packed streets and houses," and becomes in summer time "a sort of Margate for the population of Bordeaux." Dr. J. H. Bennet says of Arcachon that it is "a pretty sea-side town . . . with good hotels, picturesque villas, convenient and handsome club house and baths—indeed, all the appurtenances of advanced civilization. The summer town is built on the sandy shore of the great lake or sea, which affords excellent bathing. The lake itself, from its great extent and from its being landlocked on every side, offers every possible facility for safe boating, yachting, and fishing." After describing the Ville d'Hiver and giving much other interesting information concerning Arcachon in his entertaining book, "Winter

and Spring on the Shores of the Mediterranean" (fifth edition, 1875), and after alluding to the "rather mild and equable temperature" of the winter climate at Arcachon, to the advantage it possesses over Biarritz in being surrounded by pine forests, affording "considerable shelter against wind for walks and drives," etc., etc., Dr. Bennet nevertheless expresses the opinion that the place has been over-estimated as a winter residence for consumptives, and that it is not so favorable for this class of patients as is the Genoese Riviera. Dr. Sparks, in his article on the treatment of disease by climate, in Quain's "Dictionary," specifies Arcachon as a good resort for neuralgic patients. This place certainly presents to the invalid the rather unusual combination of a mild sea-side resort and of a pine-woods sanitarium. The air of its surrounding forests is laden to be remarkably rich in ozone, and is of course laden with the balsamic exhalations always to be found where trees of this species abound. According to Dr. Yeo, the climate of Arcachon is "sedative yet not relaxing," is "mild," and is "especially suitable to cases of irritative bronchial or laryngeal catarrh, to cases of phthisis with tendency to congestion or inflammatory complications, and to persons of nervous temperament. It is not suited to persons of a lymphatic and torpid habit, who do better in the tonic and stimulating air of the Western Riviera. Cases of consumption and of other chronic lung diseases have certainly been arrested at Arcachon, and dyspeptic persons, in whom the dyspepsia has been complicated with hysteria, hypochondriasis, and nervous irritability, have derived great benefit from its climate" (J. Burney Yeo, *op. cit.*, p. 262).
Huntington Richards.

[Dr. Lalesque, in a work entitled "Cure Marine de la Phthisie Pulmonaire," Paris, 1897, gives a very exhaustive analysis of the climate of Arcachon, and its application in the treatment of pulmonary tuberculosis. He writes as an enthusiast on the efficacy of an Atlantic marine climate associated with the balsamic atmosphere of pines, in the cure of pulmonary tuberculosis. An analysis of 252 cases treated by him at Arcachon gives the following results. Prophylactic action—68 cases with 68 cures; Curative action—184 cases, divided as follows: of the first stage, 79 cases with 27 cures, 40 improved, and 12 aggravated; of the second stage, 45 cases, with 9 cures, 24 improved, and 12 aggravated; of the third stage, 60 cases with four cures, 21 improved, and 35 aggravated. In 184 cases, then, he obtained 21.7 per cent. of cures and 46 per cent. improved. He applies very rigorously the "Cure d'air et de repos," although his patients are not under sanatorium control; and he thinks the "cure marine," as illustrated by Arcachon, gives results comparing favorably with those obtained in the mountain resorts, both being efficacious through a common element, pure air. Undoubtedly constant exposure in pure air is the principal factor in the climatic treatment of pulmonary tuberculosis, whatever the climate and wherever the resort; but so far, the high altitudes have given appreciably better results, as shown by the statistics, especially the recent ones of Turban at Davos. The open-air treatment, however, is still in its infancy, and in its wider and more strenuous application we shall, in the writer's opinion, obtain surprising results in any and all climates.—*E. O. O.*]

ARCO.—This village occupies in Austrian estimation the position which is held in Italy by San Remo, and in France by Mentone. It is situated in the extreme southern portion of the Austrian Tyrol, on the line of the railway between Botzen and Verona, three miles distant from the beautiful Lake Garda. It lies in a valley enclosed, on all sides but the south, by lofty mountains rising from four to seven thousand feet. The northern opening is protected by a mass of rock 370 feet high. The elevation of the village is slight, viz., from 250 to 500 feet above sea level. It is said to be almost windless; but little rain falls and snow is seldom seen. Its climate during the winter, which is the time of residence for in-

valids, is mild and equable, as the following chart indicates:

OBSERVATIONS OF TEMPERATURE AT ARCO, WINTER, 1875-1876. (From Eulenburg's "Real-Encyclopædie.") (Fahrenheit Scale).

Month.	Monthly mean.	Mean maximum (at noon).	Mean minimum (at noon).
October	59.5°	71.9°	52.2°
November	50.2°	60.8°	42.8°
December	41.8°	53.6°	42.8°
January	43.°	61.7°	39.2°
February	45.3°	64.4°	41.°
March	50.4°	66.2°	44.6°
April	59.°	75.2°	50.°

The relative humidity is about 72 per cent.

Dr. Weber (Ziemssen's "Handbuch der allg. Therapie," Bd. ii., S. 173) gives the following facts concerning the climate of the Italian lake region, and includes Arco in his list of places properly belonging within this climatic district. The relative humidity of such points he states as being between 72 and 78 per cent. during the autumn and winter months, and somewhat less than 70 per cent. in the spring season. The average number of rainy days is from 36 to 40 during the autumn, from 34 to 36 during the spring, and from 15 to 20 during the winter. Snow falls, as a rule, in this region, on not more than 6 or 8 days of the year, and seldom lies for several days together upon the ground. Among the local winds which prevail about all great lakes, those blowing from the north and from the northeast are of most frequent occurrence in this region. Fogs are rare; there are few days during which an invalid must keep within doors from sunrise to sunset; and there is less dust than is found along the Italian Riviera.

The mildness of the climate is shown by the fact that the orange ripens in the open air, and the olive tree, the fig, and the pomegranate also flourish.

The invalid's day is nine hours long in October, seven in November, six in December, five in January, six in February, eight in March, and the whole time between sunrise and sunset in April. The season extends from September 1st to April 1st. The class of diseases for which Arco is suited as a residence are affections of the chest and throat, anemia, want of appetite, nervousness, chronic catarrh of the stomach, intermittent fever, rheumatism, gout, and the scrofulous affections of children. There are provisions for the various forms of hydropathic treatment, and an Oertel Terrain-Cur.

The drinking-water is of good quality, and the accommodations are said to be comfortable and easily obtained. There are many attractive walks and pleasant excursions in the neighborhood.

Weber classes Arco as among the lowest Alpine climates and says its winter climate is "sufficiently mild for persons with stationary phthisis, or convalescents from the same disease, and also for those whose object is only to find change and a sunny climate."

All cases of pulmonary disease suitable for the medium and higher altitudes would of course be suitable for this climate, which offers favorable conditions for the open-air treatment; and, after all, this is the principal factor in any climatic treatment of pulmonary tuberculosis.

For the above account of Arco the writer is indebted to Dr. Huntington Richards' report in the previous issue of the HANDBOOK, and to Roe's "Health Resorts and the Bitter Waters of Hungary."
Edward O. Otis.

ARCTIC SPRINGS.—Trempealeau County, Wisconsin. POST-OFFICE, Galesville. Hotels in Galesville. These springs are situated near the village of Galesville, at the terminus of a branch of the Chicago and Northwestern Railroad. The springs are at the head of a small lake called "Marinuka," while the village is at the foot, about a mile away. During the summer a small steamer carry-

ing fifty passengers plies between the two points. The location is seven hundred and fifty feet above the sea level. The country surrounding the springs is broken by ranges of elevations called "bluffs," between which are beautiful and productive valleys from one to three miles wide. The main valleys are intersected by smaller depressions at intervals of about a mile. All of these valleys contain clear trout streams coursing down their centres. This peculiar conformation gives the country an aspect of picturesque beauty not soon forgotten when once seen. The fine scenery and salubrious climate are beginning to attract visitors to this region in rapidly increasing numbers. A large hotel is badly needed. The springs flow from beneath a precipitous bluff out of the rocks, filling a pipe six inches in diameter. The water as it flows has a temperature of 48° F. The following analysis was made by Prof. W. W. Daniels, of the State University:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Potassium sulphate.....	0.19
Sodium sulphate.....	0.07
Sodium chloride.....	0.76
Calcium chloride.....	0.05
Calcium bicarbonate.....	13.65
Magnesium bicarbonate.....	9.84
Iron bicarbonate.....	0.26
Alumina.....	0.15
Silica.....	0.06
Total.....	25.03

The water is a mild alkaline-calcic, with light chalybeate properties. It is useful in acid dyspepsia, chronic constipation, renal congestion, the early stages of Bright's disease, and in general debility.

Galesville is a thrifty village of more than one thousand inhabitants, and numbers among its attractions telegraph and telephone facilities, electric lights, water-works, a fine water-power, etc.

J. K. Crook.

ARCUS SENILIS.—Gerontoxon (from Greek, γέρων, old man, and τόξον, bow, arch); *Macula arcuata* or *macula cornea*; *Marasmus senilis cornea*; *Annulus senilis*; German, *Greisenbogen*; French, *Arc Sénile*.

Arcus senilis occupies the peripheral portion of the cornea as a light gray arc. The opacity, smooth on the surface, is more pronounced toward the limbus, being sharply defined from it by a narrow, transparent strip, while the concavity of the arc emerges gradually into the transparent cornea. The opaque arc always appears first above, and gradually advances downward. It always remains broadest above and is at the same time more opaque in this part. Finally, the two arcs unite at the outer and inner side of the cornea to form a closed ring.

The opacity is at first of a light gray color, appearing like a silver band. At a later period, the opacity assumes a denser and more creamy tint, increasing at the same time in depth and width. Arcus senilis, as the name indicates, is an affection of advancing years, and rarely occurs under fifty years of age except in those infrequent cases in which it seems to occur as an inherited characteristic. Thus, for example, I know of a family in which three male members have all had the completed arc as early as at the age of thirty-five, and in none of them is there any apparent cachexia.

The condition is usually bilateral, although one eye alone may be affected. It occurs more frequently and at an earlier date in men than in women. In warm climates it is developed earlier than in cold latitudes, and it is frequently seen in negroes on the north coast of Africa.

A condition resembling very much arcus senilis is found in the young, but is not to be confounded with it. It has been called by Wilde *arcus juvenilis*, and may be distinguished from the former by the presence of a diaphanous ring between the margin of the cornea and the opacity.

Arcus senilis never interferes with vision, although it may extend somewhat into the corneal substance.

PATHOLOGY.—Arcus senilis is due to an infiltration of a finely granular hyaline substance. It is commonly stated, even in the more recent text-books, that it is due to a fatty degeneration or infiltration of the cornea; but this has been shown by Fuchs not to be the case, for he says it is a typical example of physiological, non-inflammatory opacity. He found that the infiltrated material never has any relation to the cells of the corneal tissue, but lies free upon the surface of the connective-tissue fibres. Neither ether nor chloroform has any effect upon it; consequently it cannot be of a fatty character. Fuchs considers it to be a hyaline degeneration of certain fibres.

This deposition of hyaline masses is also associated with deposits of minute particles of lime on the more superficial layers of the cornea, close to the limbus, and the cause is assumed to be a senile atrophy of the limbus, with involution of a portion of the vascular loops contained therein. Gruber attributes the appearance of these changes in this particular portion of the cornea to the peculiarities of the circulation in the cornea; the peripheral zone being nourished mainly by transudation of nutritive materials from the circumcorneal plexus. At the same time the changes in question are favored by the fact that, with advancing age, the circulation grows less active and consequently the nutrition progresses more feebly.

Arcus senilis would, therefore, appear to be a normal phenomenon, that occurs in perfectly healthy people, is due to the decrease of nutrition incident to advancing years, and has no relation to fatty degeneration of the heart, as was formerly supposed.

There are no symptoms. The slight disfigurement and the apprehension of future trouble which many, not knowing its character, anticipate, constitute the only sources of annoyance. So far as the patient's fears are concerned, these may easily be allayed; for the condition never interferes with vision. Incisions through the arcus senilis, as in the extraction of cararact, heal as well as those made through the clear parts of the cornea.

William Oliver Moore.

AREA EMBRYONALIS.—Eggs may be divided into two general classes: holoblastic, which have a complete segmentation; and meroblastic, in which only a portion of the egg becomes divided into cells during the process of cleavage. In the first class the eggs contain little or no yolk, like the egg of a starfish. In the second class, on the other hand, there is a great deal of yolk, as in the hen's egg (see article *Segmentation of the Ovum*).

It is the second class of eggs, as a rule, in which the distinction can be drawn between the strictly embryonic portion, or *area embryonalis*, and the strictly extra-embryonic portion, or yolk sac. The *area embryonalis* is spoken of also as the *area germinativa*, *germinal disc*, or *blastoderm*. While as a rule holoblastic eggs do not show a differentiation into these two areas, it is a remarkable fact that the mammalia present a minute egg which undergoes complete segmentation and yet in its subsequent development follows the type of the meroblastic eggs.

The *area embryonalis* of the hen's egg may be taken as presenting the typical structures. This has been the subject of investigation by a number of authors, the most complete and satisfactory description being that given by Mathias Duval.

At the close of segmentation the *area embryonalis*, or blastoderm, consists of a lenticular mass of cells, about 2 mm. in diameter, lying in a hollow over the plug of white yolk. The rest of the egg is unsegmented, but in the yolk close to the periphery of the blastoderm are a number of nuclei that may be called the yolk nuclei, or *periblastic nuclei*. The blastoderm consists of two layers: an outer single layer of columnar cells, the ectoderm, and an inner mass of rounded cells, the primitive endoderm. As the blastoderm increases in size the endodermal cells in the centre become more loosely arranged, forming finally a layer one cell deep, which is separated from the yolk by

a *subgerminal cavity* filled with fluid. At the margin, on the other hand, the ectoderm forms a thick rim, and at the extreme edge it is impossible to draw an exact boundary line between the endoderm and the ectoderm. At this stage the marginal rim is somewhat broader and

mere point of connection between the primitive streak and the edge of the blastoderm—about the twelfth hour of incubation. Finally, the ectoderm separates from the endoderm at this point also and grows out over the yolk. In this way the primitive streak acquires the position shown in Fig. 263.

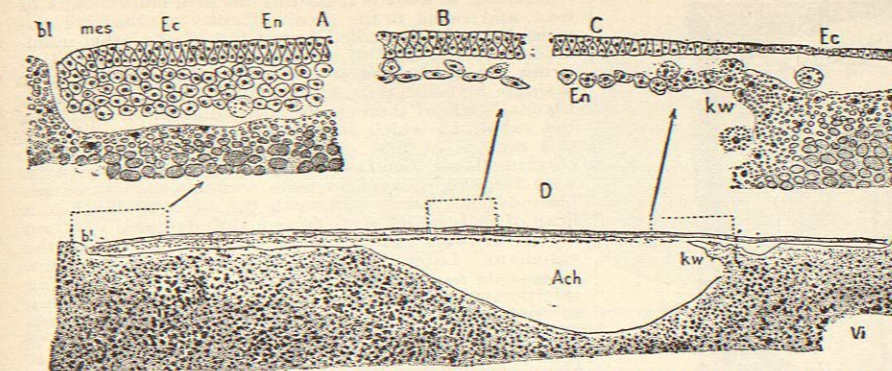


FIG. 261.—Median Longitudinal Section Through Hen's Blastoderm Incubated six hours. D, X about 40 diameters; A, B, C, details of D more highly magnified; Ach, subgerminal cavity; Ec, ectoderm; En, endoderm; kw, germinal wall; mes, marginal rim. (After Duval, from Minot.)

thicker at the posterior margin than it is at the anterior. Later, the ectoderm becomes separated from the endoderm at the margin and grows over the surface of the yolk. This process, by which the rim gradually disappears, begins at the anterior edge. Between the fifth and eighth hours of incubation it has reached the sides of the blastoderm, and it finally extends around the whole periphery. At the same time the endoderm becomes connected with the yolk at the edge of the subgerminal cavity, which meanwhile has become deeply excavated and bounded at the margin by a perpendicular wall (Fig. 261). Further growth of the endoderm takes place by the addition of cells from the periblast. The periblastic nuclei divide, and those nearest the margin become surrounded by a cell body of finely granular protoplasm, and the cells thus formed by cleavage of the yolk are added to the margin of the endoderm.

It is now possible to divide the *area embryonalis* into two regions. The central transparent portion overlying the subgerminal cavity is called the *area pellucida*, while the peripheral portion in direct contact with the yolk is the *area opaca*.

While the marginal rim is disappearing from the anterior edge of the blastoderm, a new structure is making its appearance on the median line extending from the posterior edge toward the centre of the *area pellucida*. This is the *primitive streak*. In a surface view it appears as an opaque area, and in sections it is found that the ectoderm and endoderm have the same relations to one another that they do in the marginal rim. That is, there is an accumulation of the primitive endoderm which cannot be separated from the ectoderm by any sharp line of demarcation (Fig. 262, *pr*). The primitive streak elongates with the general enlargement of the blastoderm until the marginal rim is reduced to a

directly upon Duval's theory. The experiments were made by inserting a fine sable hair in the unincubated blastoderm, after which the egg was placed in the incubator and the position of the hair was noted in the subsequent stages of development. It was assumed that, according to Duval's theory, a hair placed in the posterior median portion of the marginal rim should appear, when the primitive streak is formed, somewhere in front of the primitive streak (Fig. 265, (i), *a*), and hairs inserted in the posterior margin at X X should appear in the primitive streak or prevent its formation. On the contrary, it was found that hairs inserted at *a* and X X appeared behind the primitive streak in the *area opaca* (Fig. 264, *ii*), while a hair inserted at the centre of the unincubated blastoderm appeared at the anterior end of the primitive streak. From these experiments it may be concluded that the primitive streak of the chick does not form by concrescence, but that its anterior end is formed *in situ* by the multiplication of cells in that area, and its

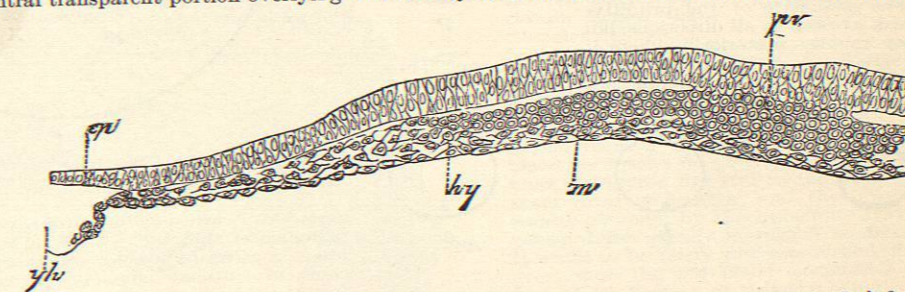


FIG. 262.—Transverse Section through the Front End of the Primitive Streak of the Germinal Area of a Hen's Ovum, incubated about eighteen to twenty hours. (After Foster and Balfour.) *pr*, Primitive streak; *ep*, ectoderm; *hy*, endoderm; *m*, mesoderm; *gh*, germinal wall.

further increase in length is probably due to an area of proliferation at its posterior end. These results are in accord with the observations of Morgan on bony fishes and of H. Virchow and Kopsch on sharks. In the blastoderm of Scyllium there is a distinct notch in the line of the primitive streak, and Kopsch found that a wound at the edge of this notch would interfere with the formation of the embryo; but a wound of the marginal rim a short distance from the notch caused only a distortion of the