you had to stand at the bed and had seen the suffering and despair of the patients, and found that the worms were eating them up, you would not think so. All these cases occurred in the month of September.—*Fred. Humbert, M. D., F. C. S.*

[Upon this communication Dr. C. V. Riley says, that the insect here referred to as attacking a human subject in Illinois, "is the *Lucilia macellaria* of Fabricius, the injuries of which to different animals are well known in the South and West, where the larva is called the 'screw-worm.' I have repeatedly endeavored to obtain the true parent of this worm. Dr. Humbert's communication is most interesting, but the specimens yet more so, as the flies he forwards are the first that have positively been bred from the larvæ known as 'screw-worms,' and they confirm the above determination of the species. The larvæ agree with others which I have from Texas, taken from the root of the ear of a hog which had been bitten by a dog."]—*Proc. U. S. Nat. Mus., Sept., 1883, p. 103.* Compare also Professor F. S. Snow's article in *Psyche*, Mar., Ap., 1883, and S. W. Williston in *Psyche*, Nov., Dec., 1883. —Eds. Naturalist.

Entomological Notes.—G. W. and E. G. Peckham have published in the Proceedings of the Davenport Academy of Sciences detailed descriptions of twenty-five species of spiders of the family Attidæ, illustrated by three rather rude photo-lithographic plates. The authors, who live in Milwaukee, are engaged upon a monograph of this family, and desire specimens of the group from all parts of the continent; they have made a good beginning and should receive aid from all quarters.——An account of the transformations of *Aglossa pinguinalis* by the late W. Buckler, appears in the *Entomologists' Monthly Magazine*, for February. So far from living on fatty substances, as stated by Rolander, which led Linnaeus to give it its specific name, Buckler states that it lives in comparative darkness, in stables, barns, and out-houses, in masses of rubbish, hidden within a protecting sheath or galley nearly or quite close to the ground, composed of materials in which they find both their food and their covering; "unless disturbed, they are never to be seen whilst growing, as they do not voluntarily leave their abodes until full-fed; but then only do they desert their quarters, and may occasionally be observed ascending walls to find a suitable place for pupation."

ZOOLOGY.

Atavism Considered as a Conservative Agent in a State of Nature.—Atavism, although a very important factor in the preservation of species, receives but little of the recognition it deserves as such; because its action in nature is not superficially apparent enough to command attention and observation, and so, though ancient in name as well as existence it may still, as far as practicable observation goes, and to all intents and purposes

be considered in its major and readily recognizable manifestations as a resultant of artificial selection, being a concomitant upon the notable unstability of forms so produced; as it rarely, if ever, occurs in appreciable degrees in organisms which have been uninfluenced by man's fostering care.

Because nature changes and develops her products so slowly that when a modification does take place, the adaptation called for, owing to the all-powerful unyielding inorganic evolution, which may be regarded as the primal cause in the production and continuance of organic evolution, is nearly always different from any of the requirements that preceded it; and the tendency is rather to gradually depart still further from the ancestral branch than to revert back towards it.

By domestication, while we, as it were, magnify the natural tendency towards variability, we also at the same time, through organic correlation, increase its coördinate force, atavism, and by this means make it apparent to the most superficial observation, and thus enable us, as has been done in the case of artificially exaggerated variability, to reason by analogy of its existence under natural conditions and of its function and mode of action there.

For while it is probably one of the most frequent and powerfully operative forces brought to bear upon organisms in a state of nature, it is confined within comparatively narrow limits, and depends rather upon continuous action, as with its collaborators, direct heredity and variability, each separate coëfficient, of which there may be several acting synchronously in the same individual, unites in producing evenly blending results with its fellows, and is bounded by the first fixed varietal characteristics existing in the immediate ancestral line.

In domesticated varieties the nearest strongly fixed point, notwithstanding the number of changes they may have undergone, or the length of time they have existed as such, is generally the ancestral feral stock, which had become stable by reason of the prepotency of natural selection.

This is especially manifest in the case of color for reasons to be noted further on. In nature its manifestations are so slight as to escape the most critical observations, necessarily, from want of proper conditions for study without trammeling and thereby modifying to a greater or less extent the species brought under observation. The characters produced by artificial selection, as exhibited in domesticated organisms, become stable only in a secondary degree and by lesser causes, namely, on account of their usefulness to man, and are preserved only through his continued supervision. That they would be, and are, as a rule, detrimental to the organisms if left to themselves, is, of course, self-evident. Consequently, they can never become so potent as characteristics derived through the agency of natural selection,

and fixed by the primary cause of prepotency, usefulness to the individuals themselves.

The function of atavism is in all probability that of serving as a restraining influence against what might otherwise be a too rapid divergence in any one direction, before surrounding and semi-dependent parts, and special instincts have become modified in such a manner as to functionate harmoniously with it. To illustrate; a too sudden change of color presenting itself, and becoming inherited in a species of bird, dependent upon it to a certain extent for protection, would, if occurring before its mental attributes had sufficient time to evolve with, and adapt themselves to it, tend towards the extinction of the individuals manifesting it, from a failure of the instinctive actions to properly perform their offices in producing the protective effects intended, while the individual cases of atavism of color, with unchanged instincts, would escape. So by the continual preservation of individuals occurring in any untoward varietal forms, atavism became a fixed law, acting as a governor to the organisms over which it holds sway, and so equalizing and neutralizing the forces and inherent tendencies towards individual and consequent specific variability, as to best serve their interests. Though in it we may also find the explanation of the extinction of some of the great races of the past, in whom, on account of the want of proper incentives to struggle for existence, they remained stationary long enough to allow it to become thoroughly fixed, and thus become so prepotent over the natural adaptive inclinations of variability by the action of selection to assume the new and necessary modifications demanded by changes of environment, as to counteract all such tendency, and, by so overreaching itself, in fact, become suicidal in its nature.

The primal cause of atavism, and the reason for such an inheritance, is found in the knowledge that all animals preserve and pass through the same embryonic stages as their immediate ancestors, as well as retaining landmarks of the more prominent changes through which they in their evolution have passed. In nearly related species the individuals do not differ perceptibly until near the latter part of the embryotic period, and in many not until after it has been passed.

Individuals at times come in contact with disturbing, physical, or nervous influences, by which some change in the system, that arrests embryological developments to a greater or less degree, in one or more parts, takes effect at the time when those certain stages of varietal divergence are being developed.

An arresting of divergence does not necessitate the loss of power to develop to maturity, but will often produce what might be termed premature development. Therefore the varietal evolution being arrested by certain disturbing influences, certain varietal germs are aborted, and the product is a preparental form or rever-

sion to one or more varietal ancestral characteristics. Under domestication color is more subject to change than any other feature. The principal reasons for this being, first, that it does not require for its production a correlative diversification of adjacent features. Any organic change of form necessarily causes some modification of the surrounding tissues and adjoining parts, thus requiring more time, energy, and force than a mere slight change of the color-secreting tissue. Second, as it is comparatively so easily affected, it has been subject to more of the passing whims and fancies of mankind than any other part, especially as it does not require the patience necessary to produce a change of form or feature.

Therefore, from already being one of the most unstable characters, man has rendered it still more so by the comparatively rapid changes that it has been compelled to undergo under the dictation of his selective inclination. Being so susceptible to variation from the parental marking and coloring, it is also the part in which we should expect atavism to occur most frequently, as is the fact.

As a theoretical illustration we will represent the development of a domesticated bird, from the beginning of life in the egg to the adult, by *A* to *Y a*, which will represent the young, and *Z a* the adult, *a* representing coloration. And a variety produced by artificial selection from the parent stock by *Z 1 b* (*1* form, *b* color). *Z 1 b* will, of course, have to pass through the same embryological stages as *Z a*, because it was derived from that stock.

As we regard the different variations of form of the species through which a variety passed before reaching its present characteristics, as remaining though usually dormant, by reason of developing or changing into the next, before the final mature form is reached, and having its representative in some embryonic or juvenile period of growth; so, if we conceive the further development as a whole or in part, checked or aborted, at a period when it is rising to the peculiarities of the next or adult form, we can perceive that those special germs whose further development is arrested will simply mature with the prior features without further evolution.

Returning to our illustration again, with *Z 1 b*, we will suppose that by some abnormal condition an arresting of that feature most susceptible to change, color is brought about. Coloration may probably commence development at *R 1*, or some other unknown period, and reach the original preparental characteristic coloration at *V*, and change to the special varietal characteristics at *X*; now, if *W* is aborted, *V* may continue to mature while the tendency is still towards the previous parent stock, and before the peculiarities of their immediate parentage have had an opportunity to dominate.

As various parts commence to develop at different times, a check

upon development at one period might only retard such features as were then commencing to develop; and those which were already too far advanced, and such as had practically no existence, would not be effected. Thus the other unaffected features would continue to develop until maturity towards those of the parents, while the feature which had been aborted would remain stationary, only maturing with the preparental feature, by correlation, at the proper time, and the result would be the form of $Z\ 1 +$ the colors $a = Z\ 1\ a$.—*Eugene N. S. Ringueberg.*

A TRANSPARENT CAVE SPONGE.—How great, says Dr. W. Marshall, in the *Annals and Magazine of Natural History* for December, 1883, is the power of adaptation in the fresh-water sponges, is strikingly proved by the interesting discovery of Dr. Joseph, who found in the grotto of Gurk in Carniolia an absolutely *transparent* (!) form of Spongilla (*Sp. stygia*). As I supposed that this fresh-water sponge, which lives all the year round under the same, or nearly the same, conditions of existence, would form no gemmules, as these would be superfluous, I applied by letter to Dr. Joseph, who forwarded some preparations to me, and at the same time kindly wrote, among other things, as follows: "Your supposition that no formation of gemmules takes place is correct, for neither in September nor in April did I find any." Some people may perhaps think that the Spongillæ of the grotto of Gurk were not descended from ordinary Spongillæ, but directly from Monaclinellidæ of salt water, perhaps at a time when the waves of the Tertiary sea eroded the grottoes of Carniolia and Friuli. This would have much more probability than the supposition that in consequence of uniform conditions of existence, not dependent upon the seasons, retrogression as regards the gemmules has occurred in *Spongilla stygia.*

NEW WORM WITH A REMARKABLE NERVOUS SYSTEM.—The *Willem Barents*, on her third voyage, captured a worm which A. A. W. Hubrecht describes under the name of *Pseudonematon nervosum.* He gives a general account of its structure, and promises a fuller monograph. The animal is about sixty-five mm. long, one and three-quarters mm. thick, tapering behind. The digestive tract runs straight through, from end to end. On the ventral side, about forty-five mm. from the head, is a disk, probably a sucker. No traces of sexual, excretory, or sensory organs were found. The epidermis is thin. The muscles form three layers, a thick external longitudinal, a middle transverse or circular, and an internal longitudinal layer, variously developed in different parts of the body. The nervous system is very remarkable; it forms a continuous layer completely around the body, and lies immediately inside the layer of circular muscular fibers. It consists (1) of a fine network of delicate filaments, appearing as if felted, barely tinged by the staining reagents; and (2) of scat-

tered nuclei, belonging partly to connective tissue, partly to ganglion cells. The layer forms a continuous tube from the head, where there is no ganglionic enlargement, back through the body to the caudal region, where the layer is present dorsally only.

NEW AND REMARKABLE PENTASTOMUM IN THE AIR-SACS OF A GULL.—P. Mégnin describes a new and remarkable Pentastomum found in the air-sacs of *Larus glaucus*. About six centimeters long and one broad, it has at first sight the appearance of a Trematode; but a microscopic examination reveals the presence of two pairs of symmetrically placed hooks at the anterior end. The new species is remarkable for the attenuated form of the anterior extremity, and the absence of any external annulation. At the front end there are two tubercles which look like aborted antennæ, and below there is an indication of a kind of segment.

On what may be regarded as the second ring there is a pair of small appendages, formed of two joints, which call to mind the characters of larval Pentastomes. The characters of these new species resemble greatly those of the Lernæidæ, and especially of the Chondracanthidæ, and seem to M. Mégnin to raise the question of the systematic affinities of these parasites. If the resemblance to the Lernæidæ is a real one, the Pentastomidæ should be ranged rather with the Crustacea than with the Arachnida.

THE SIDE ORGANS OF GASTROSTOMUS.—Mr. J. A. Ryder communicates to *Science* a description and sketches of the curious pedunculated organs of the lateral line of Gastrostomus. These are placed in groups of from two to five, forming an oblique row on the hinder margin of each muscular somite. The stalks are slender, fully a sixteenth of an inch long, and project outwards quite freely when the fish is immersed in alcohol or water. At the tip of each is a discoidal, more or less cup-shaped organ, which is more or less completely pigmented internally. The peduncles are not pigmented, and the pigment upon the circular areas immediately around the base of each peduncle is slightly reticular and less dense than that of the surrounding skin, which is deeply loaded with black. The pigmented layer of the basal disks is continuous with the outer clear sheaths of the stalks, and the medullary portion of the stalk can be seen in some cases to consist mainly of nerve-fibrils, which pass outwards to the cup-like organs at the tip. Mr. Ryder believes these organs to be tactile, and possibly luminous. In some young fishes there are naked nerve-hills on the sides of the body, and in the young of Gadus the stiff, sensory hairs of these nerve-hills project into the surrounding water; but no larval fish as yet known has pedunculated side-organs, so that in this respect, as in the rest of its organization, Gastrostomus is highly specialized.

ZOOLOGICAL NOTES.—*Protozoans.*—Professor Haeckel, in a recent paper (Sitz. Jenaischen Gesell. für Med. und Wiss., 1883) divides the Radiolaria into four orders: Acantharia, Spumellaria, Nassellaria and Phæodaria. The first are distinguished by their organic acanthine skeleton, and never have a true silicious skeleton. On the whole, they correspond to the Acanthometræ of J. Müller, but include part of the Haliomma. Actinelius, in which the central capsule is pierced by numerous simple, indefinitely arranged spicules meeting in its center, seems to be the ancestral form, and to have arisen immediately from Actinosphærium by the hardening of the firmer axial fibers into spicules. The Spumellaria have no acanthine skeleton, but their central capsule is pierced on all sides by fine pores. The ancestral form is Actissa, the simplest possible Radiolarian. The Nassellaria have a simple area of pores at one end of the capsule-axis. The skeletonless *Cystidium inerme* is regarded as an ancestral form, from which others were derived by the development of a silicious skeleton. The Phæodaria surpass all other Radiolarians in size and singularity of form. The skeleton is usually composed of hollow silicious tubes. The common characteristic of the whole order is the *phæodium*, a dark body of pigment, lying excentrically outside the central capsule. The ancestral form is the skeletonless Phæodina.

Cœlenterates.—Dr. von Martens reports, from a letter of the African traveler, Dr. R. Böhm, that a jelly-fish has been discovered in Lake Tanganyika. It belongs to the Craspedote medusæ; has a small, short, broad stomach, while the tentacles are very numerous and of unequal length.

Polyzoans.—The memoirs of the Novorossian Society contain an elaborate paper by M. Repyakoff, on the relations between the Endoproct and Ectoproct Polyzoa. In the same memoirs, M. Buchinsky publishes a paper on the development of the earthworm, with special attention to its mesoderm and nervous system.

Mollusks.—At a recent meeting of the Academy of Sciences of Paris, M. de Lacaze-Duthiers presented a note by M. Houssaye upon the operculum of the Gasteropoda. This investigator has come to the conclusion, contrary to what is generally admitted, that the entire surface of the foot does not take part in the production of the operculum, which is secreted by a small and clearly limited portion of the epithelium. This mode of production seems to be of a different nature from that of the byssus of the Acephala which is formed by a well-developed gland, occupying a considerable part of the volume of the foot. The researches were carried on partly at the laboratory of Banyuls-sur-Mer, and partly at the laboratory of l'Ecole Normale, with animals sent from Roscoff.

Crustaceans.—The transformations of a Rhizocephalus and its mode of fixation are, according to M. Ives Delage, who has occupied

three years at Roscoff in observations and experiments upon the subject, more wonderful than has been hitherto believed. The nauplius, after four days and five months, transforms into a cypris, which refuses for three days to fix itself. Then, always during darkness, it attaches itself to young crabs from two to twelve millimeters in width, seizing a hair of the crab with its prehensile antennæ. It may become fixed to any part, but prefers the back of the tail or the base of the legs, never the ventral face of the abdomen. As soon as it is fixed, it is transformed by a molt into a sort of lengthened sac, suspended by its antennæ, and without limbs. This sac secretes at its antennal pole a hollow dart, ending below in a funnel opening into the cavity of the sac, and above in a very sharp point. This dart passes through the cavity of the antennæ that has seized the hair, and pierces the teguments of the crab at the soft ring at the base of the hair. The contents of the sac then commence to enter the funnel end of the hollow dart, and pass gradually into the tissues of the victim. The contents of the sac consist of cellules, of which the superficial ones represent the cellular skin of the larva, while the central ones are a sort of nucleus which existed in the nauplius and cypris, and constitutes the genital organs. When the Sacculina has thus inoculated itself into the body of the crab, it travels to the abdominal region, and the genital nucleus pierces its envelope and the teguments of its host, and appears upon the outside of the crab. Thus the portion of the parasite in the body represents the skin of the larva. The name of Rhizocephalus is therefore inexact, and M. Delage proposes for the group the name *Kentrogonides*, and considers them very different from either Lerneans or Cirrhipeds. The parasite does not fix itself to the zoëa, nor to crabs that have passed a certain age.——Among the Crustacea found by the French expedition to Cape Horn, the most common were the large spiny *Lithodes antarctica;* another, Lithodes *(L. verrucosa)*, with shorter limbs; a Eurypodius, with extraordinarily long limbs; a small Halicarcinus, with a flattened body; a Galatea, and more rarely some shrimps and isopods, among the latter of which the genus Serolis was most common.

Fishes.—M. Ralph S. Tarr, in a communication to *Science*, states that in the winter of 1878–79, a million and a half of cod were successfully hatched at Gloucester, Mass., and placed in the clearer waters of the outer harbor. Great numbers of young fish of this species have since been caught, both in the outer and inner harbor, and the results have proved so favorable that an appropriation was obtained from Congress to build the extensive hatching-houses and basins now in course of erection at Wood's Holl, Mass.——At a recent meeting of the Linnean Society of New South Wales, Mr. Ch. de Vis described the following new species of fishes from New Britain and the adjoining islands: *Serranus perguttatus* and *cruentus*, *Mesoprion flavirosea*, *Tetraroge*

vestita, *Acanthurus zebra*, *Rhynchichthys novæ-brittaniæ*, *Harpage rosea* (a new Berycoid genus), *Salarias æquipinnis*, *Amphiprion arion*, *Pomacentrus onyx* and *notatus*, *Nesiotes purpurescens* (a new Labroid genus), *Exocætus longibarba*, *Arius armiger*, *Herpetichthys cobra* (a new Muræenoid genus), *Tetrodon insularium* and *lævis*. At the same meeting Mr. W. Macleay gave a list of the fishes captured by a beam trawl outside Port Jackson, in forty to fifty fathoms, and described the two new species, *Raia australis* and *Lepidotrigla mulhalli*.——At a recent meeting of the Linnean Society of New South Wales, Baron M. Mikluko Maclay and Wm. Mackay contribute a paper on the Plagiostomata of the Pacific, and describe *Heterodontus japonicus*. The latter gentleman also describes *Psilecranium coxii*, a large fish of the family Cirrhitidæ, taken at Port Jackson. It is rather near to Chilodactylus.——Dr. T. Gill, in a communication addressed to *Nature*, January 10, 1884, asks for further information respecting the Saccopharyngidæ, which he believes to be Lyomeri, with the branchio-anal portion much longer than the rostro-branchial, while the reverse obtains in Eurypharynx and Gastrostomus.

Reptiles.—M. W. Mackay has described *Tiaris boydii*, a lizard from the Herbert river, Queensland, and three snakes from the same locality: a Tropidonotus, a Dendrophus, and *Herbertophis plumbeus*, a new genus near Coronella.

Mammals.—Baron Maclay finds the average temperature of the body of the Echidna to be 78° F., or very little more than that of fish.——M. H. Gervais has described a new species of Megaptera from the bay of Bassorah. Van Beneden, in a recent work, has referred the humpbacks to a single species, but M. Gervais combats this, and recognizes three, *M. boops*, of the northern hemisphere; *M. Lalandii*, inhabiting the South Atlantic; and the species from the Persian gulf, a species which he names *M. indica*. In size this form equals *M. boops*, but the head is more globular and the bones thicker, as well as more compact and denser. The upper profile of the head is more curved, the rostrum more obtuse, and the mandible more arched. The exoccipitals project more and the condyles less than in *M. boops;* the occipital foramen looks more backward; the zygomatic process is shorter and more massive; and the palatines differ from the northern species in their form, their greater thickness, and their extensive articulation with the maxillary. The sternum differs completely in its form from that of any other whalebone whale. There are also many other differences in the shape of the bones of the skull, vertebra, ribs, etc., and the pectorals are proportionately longer than in *M. boops*.

PSYCHOLOGY.

Peter's Search for Home—Another Cat story.—" Peter " is the name of a small-sized cat now lying at my feet under the kitchen stove, reposing in what might be called a condition of