STOWELL'S MICROSCOPICAL DIAGNOSIS.

Microscopical diagnosis. By CHARLES H. STOWELL, M D., and LOUISA REED STOWELL, M.S. Detroit, *G. S. Davis*, 1883. 8+93+118+35 p., 10 pl. 8°.

THE title of this book led us to expect a work specially referring to the applications of the microscope in medical practice, and we felt that a good book of that scope would be welcome and valuable. As in the opening sentence of the preface Professor Stowell says it has been his good fortune to be so situated, during the past few years, that his entire time has been devoted to the study of histology and microscopy, with special reference to the microscope in its relation to the practice of medicine, our anticipations seemed confirmed, and the expectation added, of finding much new and original matter. An examination of the body of the book was disappointing, because it gave us acquaintance with contents so miscellaneous and varied that we were reminded of those so-called 'happy families' where discordant associates live in compulsory peace, — something quite unlike a natural and well-proportioned assemblage.

The first eighty-two pages alone deal with clinical microscopy, and we think not satisfactorily; for the treatment is hurried and incomplete, though certainly accurate, what there is. The best part is the few pages on urinary deposits, with the accompanying admirable plates by Mrs. Stowell. The portion on parasites and tumors is extremely inadequate. The three specimens of Demodex figured, must have encountered some frightful disaster before they were drawn. We regret, that, instead of all this, the author did not prepare a translation of Bizzozero's *Manuale di microscopia clinica*.

The bulk of the book is made up of botanical articles, by Mrs. Stowell, on starch, wheat, and various medicinal plants. These are pleasantly written, and the illustrations display the authoress's skill in drawing; but we miss in these, as in the other parts of the volume, any definite purpose, either of text-book writing or original research. In this connection, we are impressed by the absence of references to scientific literature.

Part iii., by Mr. Walmsley, describes the methods employed by him in the commercial manufacture of microscope slides. It is extremely elementary, and the methods most employed in scientific biology are in large part unmentioned. The same subject of methods has been far better treated by numerous previous writers.

In short, we are quite at a loss to discover the *raison d'être* of this pleasantly and clearly written, as well as beautifully illustrated work. The new and original matter which we looked for, after reading the preface, we have not found; yet the facts and figures seem all to rest upon personal observation.

To the amateur microscopist, the book may well serve as a guide to certain things not elsewhere so well described.

WEEKLY SUMMARY OF THE PROGRESS OF SCIENCE.

MATHEMATICS.

Classification of surfaces. — In a memoir contained in the Abhandl. kön. akad. wiss. zu Berlin for 1868, M. Christoffel treated of the classification of surfaces by formulating the changes which took place in a geodetic triangle on the surface when it was displaced or moved along on the surface. M. Christoffel was thus led to a classification of surfaces which divided them into four groups. The first group contained all surfaces upon which no displacement of a geodetic triangle could take place without altering the triangle; the second group contained surfaces upon which a geodetic triangle might be displaced without alteration, provided its angles moved upon certain determinate curves; the third group contained surfaces upon which the geodetic triangle might be displaced without alteration in a singly infinite number of ways; and the fourth group contained surfaces upon which the triangle could be displaced in any manner without alteration. In the present paper, M. v. Mangoldt revises this classification, and shows that the surfaces contained in the third and fourth groups are identical, and that they include all surfaces with a constant measure of curvature, and only these. Also he shows that the second group contains all surfaces which are developable upon surfaces of rotation which have not a constant measure of curvature, and only these. The author further revises a paper of Weingarten's, correcting an error which appeared there. — (*Journ. reine ang. math.*, xciv. i.) T. C. [74

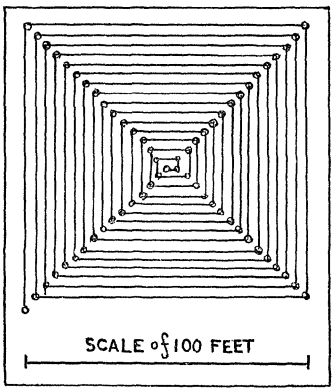
PHYSICS.

Electricity.

Aurora borealis. — Professor Lemström has now given a somewhat detailed account of his apparatus and experiments in Lapland. He and others had years ago in that country observed a pecular luminosity, which he calls 'phosphorescent,' in the form of 'tiny flames' playing about the tops of small mountains.

As long ago as 1871 an attempt was made to assist the production of the aurora upon these hilltops; but the results obtained were not, to scientific men in general, entirely satisfactory. Accordingly, in 1882, Prof. Lemström prepared to repeat his experiments upon a more extended scale.

Upon the top of Oratunturi Mountain (lat., 67° 21′; long., 27° 17′.3 east of Greenwich), about 540 meters above sea-level, he laid out, upon insulators raised about 2½ m. above the ground, a bare copper wire in the form shown in the illustration, the wires being about 1.5 m. apart. The area covered in this way was about 900 square metres. The single wire which made up this spiral was provided with numerous points soldered on; and the inner end was connected by an insulated line with the observing-station at the foot of the mountain, where the circuit ran through a galvanometer and into the earth.



ARRANGEMENT OF WIRES.

From the day the apparatus was finished, viz., Dec. 5, "there appeared almost every night a yellowish-white luminosity around the summit of the mountain, while no such luminosity was seen around any one of the others! The flames were variable in intensity, and in constant oscillation as those of a liquid fire. Three times it was tested, 2½ miles off in south-east, by a Wrede spectroscope (small size with two prisms), and it returned a faintly continuous spectrum from *D* to *F*, in which the auroral line $\lambda = 5569$ with soft variable intensity was observed." The galvanometer, meanwhile, showed an extremely variable positive current from the wire at the top of the mountain to the earth.

An attempt was made to determine approximately the electromotive force of this current by occasionally introducing into the circuit a Leclanché element, and observing the change thus produced. As the insulation of the line leading up the mountain was not good, however, we must accept with caution, as Prof. Lemström admits, the results thus obtained. The current from the mountain top was apparently sometimes less, and sometimes considerably greater, than the Leclanché element produced.

Similar results were obtained at Pietarintunturi Mountain (950 metres above the sea, in lat., 68° 32′.5; long., 27° 17′.3 east of Greenwich), where a smaller spread of wire was used.

There seems to be very little doubt that Prof. Lemström has succeeded in producing the aurora at will, or rather in assisting nature to produce it. Some of the conclusions which he draws from his experiments, however, will, no doubt, be received with caution, not because they set forth any thing in itself improbable, but because the experiments described seem too few and rough to decide the matter beyond a doubt. Thus he believes that "the *electricity* which descends into the auroral belt [the circumpolar belt of maximum auroral activity] is the *primary* cause of the greatest part of the terrestrial current, and, through this, of the variations of the magnetic elements." Moreover, finding that in several cases observers in different stations were near mistaking different auroral arcs for the same one, he concludes that "*all* measurements of the height of the aurora, calculated on those with a long base north and south, are always erroneous, as the two observers *never* see the same aurora. And even those calculations which are based on the measurements of the height and length of an arc from one point, and the hypothesis that the arc extends around the magnetic pole, must be considered very unreliable, as no satisfactory answer can be given as to what results would have been obtained a little farther north or south. This is also the case with aurorae with long bases east and west," etc. He says, therefore, "That the height of the aurora borealis is very variable I fully admit, but in my opinion it has been greatly over-estimated."

It seems probable that a great many people incline to a similar opinion,[1] and will merely regret that Prof. Lemström has not given them some better foundation for their disbelief. For many years, however, the doctrine has been current that auroras frequently exist at a height of a hundred miles or more; and the substance of Prof. Lemström's present arguments against such a belief must have been old for a long time.[2]

On several occasions it was observed by Prof. Lemström's party that the peculiar spectroscopic auroral line "was returned from every quarter of the horizontal plane, (and) even from the zenith, *without any aurora being visible.*"

Another phenomenon of much interest is a "peculiar phosphorescent 'shine,' or diffused luminosity, which possesses several phases, but the general character of which is a luminosity of a yellow-white color, which renders the night as light as the moon with a thick hazy air." On one occasion "every object around stood out clearly in a yellow-white hazy phosphorescent luminosity of quickly-shifting intensity." Apparently no spectroscope was at hand at this time; but on another night, when a similar 'shine,' less bright, but still sufficient to nearly obscure the stars upon the horizon, was seen, an attempt to discover the auroral line was unsuccessful. It is true that the spectroscope used was not well

[1] *Proc. roy. soc.*, 1879-80, xxx. 332.
[2] *Amer. journ. sc.*, xxxix. 286.

adapted for the purpose; and Prof. Lemström attributes the phenomenon to the same origin as the aurora.

Prof. Lemström refers to Groneman's meteoric theory of the aurora, and no doubt considers it to be disposed of by the experiments above described. It happens, however, that the same number of *Nature* contains an article from Dr. Groneman, in which he says, "I believe I have proved by this research that there existed with the aurora of Nov. 17, 1882, cosmic dust, passing through the upper strata of our atmosphere with great velocity, and giving, according to the most interesting observation of Mr. Rand Capron, 'the usual green line' of the aurora spectrum;" and, further, "It is very remarkable that this experiment comes at the same time as the interesting experiment of Prof. Lemström, showing that electric currents are able to give a development of light in our atmosphere, possessing the same number of undulations in a second as the auroral light. Now our meteoroid being part of an aurora, it gives a stronger proof of the origin of that phenomenon than Prof. Lemström's experiment, the greatest attraction of which is that we are able to repeat it arbitrarily and with our own means. Further, I have always maintained that electricity, excited easily by friction, must be one of the causes of the auroral light . . . and it seems to me very plausible that cosmic matter, approaching the earth, induces electric currents through the air. Therefore I think that the results of Prof. Lemström are in full harmony with the idea of a cosmic origin of aurorae." — (*Nature*, May 17, 31, June 7.) E. H. H. [75

CHEMISTRY.

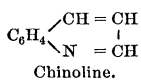
(*Organic.*)

A new acid occurring in the juice of the beet. — E. O. Lippmann claims to have discovered a new acid in the incrustations which form in the evaporating-pans from the juice of unripe or partially decomposed beet-roots. Analyses gave results corresponding to oxycitric acid

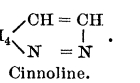
$$\left(\mathrm{COOH-CH_2-C\frac{OH}{COOH}C\frac{H_2}{COOH}}\right),$$

obtained by Pawolleck by boiling chlorcitric acid. — (*Berichte deutsch. chem. gesellsch.*, xvi. 1078.) C. F. M. [76

Cinnoline-derivatives. — V. v. Richter found, that, by warming an aqueous solution of the diazochloride of orthophenylpropiolic acid, a carboxylic acid of *cinnoline* was formed, a substance which he regards as an analogue of chinoline.



Chinoline.



Cinnoline.

— (*Berichte deutsch. chem. gesellsch.*, xvi. 677.) C. F. M. [77

Compounds of the ketones with hydrazine. — The action of phenylhydrazine upon ketones seems to be analogous to that of hydroxylamine. With acetone, H. Reisenegger obtained the compound $C_6H_5N_2HC(CH_3)_2$, which was decomposed, by warming with dilute acids, into acetone and phenylhydrazine. Acetophenonphenylhydrazine resulted from the action of phenylhydrazine upon acetophenon. Oenanthol gave the substance $C_6H_5N_2HC_7H_{14}$. With dimethylhydrazine, acetophenon formed chiefly $(CH_3)_2N_2C\overset{C_6H_5}{\underset{CH_3}{}}$. — (*Berichte deutsch. chem. gesellsch.*, xvi. 661.) C. F. M. [78

METALLURGY.

Sulphuric acid from pyrites. — There are very evident advantages in using pyrites instead of brimstone for the manufacture of sulphuric acid, provided the right kind of pyrites is at hand. The qualities necessary are a high per cent of sulphur and iron, in order that the cost of handling may be a minimum. Lead, zinc, calcium, and magnesium can only be present in very small quantity, as they will roast to sulphates, and so cause a loss of sulphur; moreover, they lessen the value of the iron as a by-product. Copper to the amount of two or three per cent is found in some of the best pyrites for this purpose, and is extracted as a by-product. But the especial element to be avoided is arsenic, both on account of the rapid corrosion of the chambers, and the rendering of the acid unfit for many uses. The cost of a ton of oil of vitriol made from brimstone is estimated at $13.58; made from pyrites, at $8.22. A number of localities in America furnish pyrites of good quality. The only alterations in the plant are the addition of a Glover tower, and the substitution of suitable kilns, of which illustrations are given, as well as of the Schaffner shelf-burners. — (*Eng. min. journ.*, May 5.) R. H. R. [79

The Henderson gas-furnace. — This furnace attempts to attain to the highest heats required in the shortest possible time, and with a complete utilization of the fuel. These objects are reached by the use of separate engines, one for the supply of air for the generation of the gas, and the other for its combustion. The details of a trial and illustrations of the furnace are given. The consumption of fuel, three hundredweight per hour for the two-ton furnace, is low. — (*Eng. min. journ.*, May 19.) R. H. R. [80

GEOLOGY.

The mines of Cuba. — Salterain gives a brief account of the mines now worked, or that have been worked in the past, at least so far as known by the general inspection of mines. The 'minas de asfalto y de aceites (oils) bituminosos' are divided into mines of asphalt, of petroleum, and of naphtha, and number seventeen in all. The prospects are considered favorable, about eleven or thirteen hundred tons being produced annually. They are situated mostly in the provinces of Pinar del Rio, Matanzas, Santa Clara, Pto. Principe, and Habana. The copper-mines are thirty in number, almost all situated in the province of Santiago de Cuba, and a few in Santa Clara. The mineral consists of veins of sulphate of copper, oxide of copper, native copper, carbonate of copper, and indications of copper pyrites, all of which,

at a certain depth, are supposed to unite in one vein of sulphate of copper. The iron-mines, seventeen in number, are all situated in the province of Santiago de Cuba. The iron consists of large superficial masses of oligist and magnetic iron ore. Manganese is very abundant in the province of Santiago de Cuba, but only two mines have been registered on account of its small commercial value. There are five gold-mines situated in the provinces of Santiago de Cuba and Santa Clara, whose prospects are considered good, but which are not worked at present. Guano is worked in the islets south of Cuba, and 104 workmen were employed on this work last year. — (*Breve reseña miner. Isla de Cuba.*) J. B. M. [81

The Prescott (Arizona) mining region. — A map of this region, with some account of the rocks and veins, has been published by John T. Blandy. The rocks appear to be mainly granites, argillites, and schists. The majority of the veins trend approximately north and south. In the stratified rocks many veins occur having the strike and dip of the enclosing rock, but they are of limited extent. In the Peck district the veins are of quartz, carrying silver in the form of chlorides, sulphides, and in galena. The argillite has been eroded away so that some of these veins stand as much as fifty feet high, while they are not more than six feet thick at the base. In the granite ridge next north, the veins are quartz and barite, carrying silver, while in the gneissoid rocks they are part silver and part gold bearing. The veins in the Mount Union granite are principally gold bearing, the gold being free on the surface, but in pyrite in depth. The chief portion of the remaining veins in the region are mixed gold and silver bearing, some being as much as thirty feet in thickness. Some veins of copper pyrites also occur. — (*Trans. Amer. inst. min. eng., Boston meeting.*) M. E. W. [82

GEOGRAPHY.

Russian cartography. — M. Michel Venukoff presents frequent brief reports of Russian explorations and topographic work to the French geographical society, and has recently described the annual exhibition of astronomical and geographical works held last April in the Winter palace at St. Petersburg. The number of exhibits exceeded one hundred and forty, among which the more notable were a route-map of Russia in Europe (1:1,050,000), in twenty-five sheets, of which seventeen are finished; the latest sheets of the special maps of the same country (1:420,000), published under the direction of Gen. Strelbeitsky; the general map of Russia in Asia (1:4,200,000), in eight sheets, extending to lat. 30° N; maps of the provinces of Finland and Bessarabia; of the peninsula of Kamtchatka, prepared at Irkutsk; of the territory of Semipalatinsk, lithographed at Omsk; the Chinese and Persian frontiers (1:840,000); and many others of regions concerning which our chief knowledge comes from Russian surveys. — W. M. D. [83

(Arctic.)

Notes. — Professor J. E. Nourse of Washington announces that he has in preparation a work relating to American polar expeditions. —— The Russian imperial geographical society of St. Petersburg suggests that the observations of the international polar stations be prolonged over another year, on the ground that a single year's observations cover too short a time to afford really satisfactory comparative results; and, moreover, it will be necessary for some of the more advanced parties to make an end of their observations before the full year is out in order to be sure of returning during the present autumn. —— Reports from Bering Sea indicate that the winter there has been a severe one. Early in the spring there was an abundance of ice as far south as St. Paul Island. Very few whales had been taken up to latest advices. —— The report of the court of inquiry into the circumstances of the loss of the Jeannette and the death of members of the expedition is just printed. It does not contain the private journals of De Long and Collins, nor the papers of the latter which were before the court. The text of the report has been mostly summarized by the daily press, and contains nothing new of importance. It is presumed that the log-books, and records of observations, etc., are reserved for a report on the results of the voyage, to be hereafter issued. The most valuable thing in the whole document, which contains a number of maps and diagrams, is the map of the Lena delta constructed by Nindemann, which contains additions to and corrections of the maps in present use. — W. H. D. [84

(Asia.)

Notes. — The Revue géographique presents its subscribers with a new chart of Asia on a scale 1:34,000,000. Although containing some new matter, it is not up to date, and is of very imperfect mechanical execution. —— The Russian explorer Konchin telegraphs from Krasnovodsk, that, in crossing the steppe between Charzhui and Uzboi, he has discovered that Kalitin was mistaken in supposing it to be traversed by an ancient channel of the Oxus. What the latter explorer, three years ago, took for the dry bed of the Charzhui-Daria, is really only a plain bounded on the north by a series of elevations, and appearing to have no definite limits toward the south. —— Potanin and Skassi are about to explore the Chinese province of Gan-su and the adjacent parts of Mongolia. Sukhacheff, a young proprietor of Siberian gold-mines, has contributed 20,000 rubles toward the expenses of the exploration. —— The topographic and geodesic work in northern Khorassan and southern Turkestan being finished, the boundary-line between Russia and Persia from the Caspian to the Heri Rud River of Afghanistan will be established immediately. —— The definite establishment of the boundary between the Russian province of Semipalatinsk and the Chinese district of Tsungari will also be concluded this summer. By recent conventions a considerable part of the basin of the upper Irtish River is annexed to Russia. Topographers are busily engaged in determining its limits, while others continue the work of demarcation of the districts of Kuldja and Tarbagatai, which is already well advanced. Still others are developing the official limits

between the basins of the Syr Daria and the Tarim rivers. — W. H. D. [85

Oxus and Caspian. — A recent report on the levellings undertaken by the Russian engineers to determine if the Oxus (Amu-daria) could be turned from its present channel, which leads to the sea of Aral into the Usboi channel, leading to the Caspian Sea, decides that it is impossible without extended artificial works. A canal would have to be constructed for a length of over two hundred versts, at a cost of at least fifteen to twenty million rubles, before it would be possible to divert the Oxus from its present course. — (*Peterm. geogr. mitth.*, 1883, 231.) W. M. D. [86

(*Africa.*)

Notes. — Joseph Thompson's party has been heard from, having been obliged to retreat to Mombasa, on account of hostilities excited by a caravan in advance of them. All well, and would make another start with a different caravan. —— Schweinfurth has made a scientific journey from Cairo to Mirsa Tobruk in Cyrenaica. —— News has been received from the delayed Italian expedition to Abyssinia and the coast of the Red Sea, according to which the principal official party are detained at Debra Tabor by King John, while the explorer Antonellé has succeeded in getting away from Assab and in travelling through the Aussa country, previously closed to Europeans, to Schoa. —— Dr. Pogge has returned to Mukenge, according to a letter forwarded by Portuguese traders from Malange, and will shortly depart for Europe. —— The German traveller Flegel has returned to the coast from his journey in Adamaur. —— The British government has annexed the territory lying south-east of the former limits of Sierra Leone as far as the Liberian boundary, between that and the Sherbro Islands. —— Several French trading-stations have recently been established on the Futa Diallon coast, northward from Sierra Leone, in the hope of opening a lucrative traffic with the rich interior districts. —— The French naval surgeon Colin has been intrusted with a mission to the old gold-country of Buré on the upper Senegal. —— The Morocco authorities have permitted Spain to undertake a topographical investigation of the country around Santa Cruz de Mar Pequena, on the coast opposite the Canary Islands. —— The khedive has appointed the minister of the interior and former governor of the Soudan, Eyoub Pacha, to the presidency of the Société de géographie de Cairo. The general secretary is Dr. Bonola. —— The credits granted for the Algerian administration, by the commission to revise the estimates, amount to about twenty-eight and a half million francs, of which about three million francs are for purposes of colonization. The imports into the colony from all sources in 1880 were about eighty millions, and the exports about fifty-six millions. The customs receipts from all sources were about ten million francs. —— Lieut. Angelo Cardozo of the Portuguese navy has just returned from Mosambique, where he has been eight months engaged in explorations in Sofala-land. He ascended last September from Inhambane toward Mulamula and Pachano, along the mountains to Maringua, and across the Sabia River to Goanha; thence, descending the Gorongoza to Sofala, he returned to Inhambane by the seacoast. —— Herr Beine has just been sent by the International African association to relieve Becker and replace M. Maluin, whose state of health requires an immediate return to Europe. —— M. J. Lapeyre, second in command of the Giraud expedition, whose health had given way, was obliged to return from Aden to France on that account. — W. H. D. [87

BOTANY.

Systematic histology. — By this term, Vesque designates the systematic classification of plants on the basis of histology. The variations of histological elements, as regards size, shape, and distribution, even in a single genus or species, are very wide, and, with limited exceptions, have not hitherto been regarded as very useful characters in classification. Vesque endeavors to show by an examination of the orders Capparidaceae, Cruciferae, and Frankeniaceae, that some histological characters are so nearly constant as to justify their employment in systematic botany. Such, for instance, are the stomata and hairs, the mucilage-cells, the palisade-cells, the shape and composition of the fibro-vascular bundles, etc. But, as was to be expected, the cases in which the histological characters are uncertain are so numerous as to be discouraging. That the species in many genera can be arranged in natural groups on the basis of their minute structure appears to be pretty clearly made out by Vesque's contributions. — (*Ann. sc. nat.*, Oct., vi. xv. 2.) G. L. G. [88

Flowers of Aesculus glabra. — One of Prof. Coulter's students finds that the perfect flowers of the buckeye are protogynous, while others, which at first sight appear protandrous, really have imperfectly formed pistils. They are thus polygamous, with, it is thought, a tendency to monoicism. Bees, especially Apis, visit them, but go only to unopened buds, from which they obtain nectar by crowding their tongues between the petals. "The open flowers were avoided, and could only have been fertilized by the chance of being near the buds; for the bees had evidently learned that the latter contained the nectar. . . . It is a case of an insect attracted by a flower which it does not visit, but may accidentally fertilize, and obtaining nectar from a flower which it can neither fertilize nor obtain pollen from." The species is worthy of further study. — (*Bot. gazette*, June.) W. T. [89

ZOÖLOGY.

(*General anatomy and physiology.*)

Olfactory lobes of insects and vertebrates. — G. Bellonci, in continuation of his two previous articles (*Mem. accad. sc. Bologna*, 1880, and *Atti accad. reale lincei*, 1880–81) on the olfactory lobes of arthropods, now reports his further observations, which he has also extended to vertebrates. The same fundamental plan determines the structure and relations of the olfactory lobes in both the higher arthropods and the vertebrates. The olfactory and

commissural fibres of the lobes are resolved into a fine reticulum, which, grouped in certain spots, forms what Bellonci calls the olfactory glomeruli. The lobes of arthropods have an outer portion with a diffuse reticulum, and an inner portion with glomeruli. In vertebrates the ganglion-cells lie within the region of the glomeruli. In vertebrates and crustaceans there are numerous small, and fewer large, cells. In insects the elements are of small or medium size. In both arthropods and vertebrates the fibres establish both a direct and a cross (chiasma) communication between the olfactory and optic lobes; likewise between the olfactory lobes and the higher centres (reniform bodies of Squilla, fungiform of insects, and hemispheres of vertebrates). These resemblances the author attributes to an analogy of function, and not to a morphological homology between vertebrates and arthropods. The observations were made on Squilla, Gryllotalpa, the eel and frog. — (*Arch. ital. biol.*, iii. 191. A wrong title is given at the head of the pages.) C. S. M. [90

Protozoa.

Action of tannin on Paramecium. — H. J. Waddington states, that, by bringing a drop of a solution of one part tannin in four parts glycerine in contact with a drop containing a Paramecium, the motion of the animal is stopped, and the cilia become beautifully distinct. They appear quite straight and surprisingly long, equal to the short diameter of the body. Previous ideas as to the size and number of the cilia have been very incorrect. To kill infusoria he recommends a saturated alcoholic solution of sulphurous acid; for, if a small quantity be added to water, the gas is set free, and the animals in the water poisoned. He also reports an ingenious device to catch infusoria: crumbs of very hard baked biscuit are put in the water, where they will be held up by confervae; fungoid growths spring from each crumb, the infusoria collect between the filaments as in a favorite resort, and the whole colony may be captured by pulling out the crumb. — (*Journ. roy. micr. soc. Lond.*, iii. 185.) C. S. M. [91

Descriptions of rotifers. — To the eight species previously described of the genus Floscularia, C. T. Hudson now adds three, and gives also some notes on F. regalis Hudson. These four last-mentioned species are described and figured, and a synoptic table of all the species is added. In an appended note, the author comments on Leidy's Acyclus and Dictyophora (cf. SCIENCE, i. 37). He thinks Acyclus is related to the floscules. "Its 'oral cup' with the 'incurved beak' may be fairly said to be the buccal funnel of a floscule reduced to the possession of one lobe, viz., the dorsal one." The remainder is concerned with details, and with the degradation of certain rotifers, considered in connection with the absence of the trochal disk. — (*Journ. roy. micr. soc. Lond.*, iii. 161.) C. S. M. [92

Worms.

Anatomy of Gephyreans. — Dr. C. Ph. Sluiter gives a preliminary notice of his observations on the anatomy of various species. An abstract will be given of his definite memoir when published. — (*Zool. anz.*, vi. 222.) C. S. M. [93

Annelid messmates with a coral. — J. W. Fewkes finds annelid tubes formed on the rim of young Mycedium fragile. As the coral grows, it spreads round the worm-tube; but the latter grows usually equally with coral. The presence of these tubes affects the regular growth of the coral. The species of worm does not appear to have been determined. — (*Amer. nat.*, xvii. 595.) C. S. M. [94

Spermatogenesis of Nemertines. — In an article in the *Revue sc. nat.*, 1882, 165, Sabatier describes the development of the spermatozoa in nemertean worms. The parent cells separate into two parts, the central blastophore and peripheral bodies, which become independent, and attach themselves to the wall of the spermisac. From these bodies the spermatozoa arise by differentiation of the peripheral part into spherules, which elongate and become spermatozoa. In his theoretical conclusion, the author adopts the theory first advanced by Minot (*Biol. centralbl.*, 1882), that the ordinary cells are neuter, or combine both sexual elements, and that when a separation takes place the sexual products are generated. He makes an addition, however, to the theory, by the hypothesis that the central portion is female, the peripheral male. (There are many facts which appear at present irreconcilable with this view of the sexual relations within the cell.) — (*Journ. roy. micr. soc. Lond.*, April, 1883.) C. S. M. [95

VERTEBRATES.

Action of alcohols on the heart. — The relative effects of different alcohols of the marsh-gas series of hydrocarbons upon the ventricle of the frog's heart have been compared experimentally by Ringer and Sainsbury. The method of experimenting was to place the heart in a Roy's tonometer, and feed it with the extract of dried bullock's blood until it was beating normally; the alcohol used was then added to the circulating liquid in such quantities, determined by previous experiments, as to completely arrest the contractions of the heart within an hour. The toxic action of the alcohols used was measured by the dose sufficient to arrest the activity of the heart. The following results were obtained. Normal methyl, ethyl, and propyl alcohol, — all three stop the heart in diastole, the ventricle losing its power to beat spontaneously, and refusing to respond to external stimulation. The excitability of the heart to electrical stimulation is diminished. The 'period of diminished excitability' is shortened. The primary effect of the alcohols on the heart is not, as might be supposed from their therapeutical use as cardiac stimulants, to increase the force or frequency of the ventricular contractions. The height of the curve given by the tonometer diminished steadily from the first application of the alcohol, and the frequency of the beats remained unaffected, except in the later stages, when the power of the heart to beat spontaneously was lost. With regard to the toxic action of the different alcohols, the following numbers are given (the figures represent the number of

minims of absolute alcohol in a hundred cubic centimetres of the circulating liquid, necessary to cause complete arrest of the heart): methyl, 205.5; ethyl, 114; propyl (primary), 59.3; isobutyl, 17; isoamyl (amyl alcohol of fermentation), 6.6. The activity of the higher members of the series increases rapidly; and as the propyl, butyl, and amyl alcohols are constituents of fusel oil, we have evidence of the directly injurious effect of this impurity of ordinary alcoholic drinks. — (*Practitioner*, xxx. v. 339.) W. H. H. [96

Pulmonary epithelium. — Bozzoli and Graziadei publish a note chiefly to claim priority for certain of their observations on the lungs. We have only to notice that they have not seen any hyaline plates without nuclei in the epithelium, such as Feurstack has described. They also again insist upon the presence and pathological importance of groups of little cells, not yet differentiated into the special pulmonary epithelial cells (plates). — (*Arch. ital. biol.*, iii. 222) C. S. M. [97

Birds.

Molecular layer of the retina. — According to Bellonci, the formation of the inner molecular layer of the retina begins in the chick on the eighth day of incubation. At that time there is a special row of clear cells just outside the layer. The cells in the situation of the layer disappear on the ninth day: the clear cells undergo fatty degeneration of the nucleus, and disappear by the twelfth day. They form the molecular layer, which, however, continues to enlarge. Both the inner and outer molecular layer are penetrated by optic nerve-fibres. Thus is produced a structural relation with the molecular layers of the brain. — (*Arch. ital. biol.*, iii. 196.) C. S. M. [98

The birds of Tonkak. — In this paper Herr Müller has given us an elaborate review of the birds of this island, based on a collection of sixteen hundred skins of one hundred and fifty-five species. The paper contains many systematic notes of interest. The author has prepared an extended set of tables from which he concludes that the Tonkak birds belong rather to the Indo-Chinese sub-region than to the Indo-Malayan as given by Wallace. — (*Journ. f. ornith.*, xxx. iv.) J. A. J. [99

Mammals.

Development of the liver and lungs. — In connection with his researches on the development of the body-cavity Uskow made some observations on the liver and lungs of embryos. From the sinus venosus there grow out irregular cavities into the septum transversum, which extend into papillary growths, projecting into the pericardial cavity. The papillae are, of course, covered by a continuation of the epithelium of the pericardial cavity. They afterwards unite into a spongy mesh of tissue, into which the liver extends as it grows. The further history was not followed, but it is probable that the hollow outgrowths from the sinus venosus become hepatic vessels.

Concerning the lungs, from a study of a rabbit embryo of a little less than ten days, Uskow draws the following conclusions. At the time of the closure of the 'vorderdarm,' the separation of oesophagus and trachea is already indicated. The lung is an unpaired evagination of the ventral wall of the 'vorderdarm.' The trachea and the lung arise at the same time, and independently; but the separation of the lung from the 'vorderdarm' precedes the separation of the trachea. The lung arises immediately in front of the liver; at the same time the cells of the mesoderm around the lung proliferate; and Uskow believes that the pleural (i.e., coelom) epithelium forms not only the pleural epithelium, but also the deeper-lying mesodermic elements (muscles, etc.) of the lung. — (*Arch. mikr. anat.*, xxii. 219.) C. S. M. [100

A hybrid between the gayal and zebu. — Dr. Julius Kühn announces the birth, at the agricultural institute of the Halle university, of a hybrid between the gayal of eastern India and the long-horned race of zebus known as sangas, which was held in domestication by the ancient Egyptians, and is now abundant in Soudan and Abyssinia. The hybrid in question is a female; it weighed, at birth, 21.5 kilograms, or about one-twentieth the weight of the sanga mother. The latter is of a mottled red and white color, while the calf is of a clear red brown, only the belly and inner sides of the legs and the fetlocks being white. The hump on the withers, so characteristic of the zebu, is only slightly developed. "In the birth of this animal it is shown that animals of the most primitive forms, which for thousands of years have had unchanged surroundings, by suitable treatment, may remain unimpaired in fertility, even when placed in relations which are in the greatest degree different from those of their native home." — (*Zool. garten*, xxiv. 1883, 126.) F. W. T. [101

ANTHROPOLOGY.

Origin of the Magyars. — Mr. Herman Vambery published a work in Leipzig last year, in which he takes the ground that the Hungarians are of Turkish and not of Finno-Ugrian origin, as is believed by most ethnologists, and especially by M. Hunfalvy. A census of the Turco-Tatar stock is given, which may be of service to some of our readers.

Turco-Siberians	141,992
Eastern Turkestan	1,040,000
Kirghiz	2,299,366
Kara-Kirghiz	350,000
Turcomans	1,000,000
Kara-Kalpaks	70,000
Usbegs	2,500,000
Kipchaks	70,000
Kuramans	77,301
Sarts	900,000
Bushirs	500,000
Tatars	638,710
Nogajs	200,000
Kuvaks [?]	600,000
Kalmuks	71,000
Transcaucasic Turks	900,000
Iranic Turks	200,000
Osmanli	10,000,000
	21,558,369

— (*Archiv. per l'anthrop.*, xii. 297.) J. W. P. [102

Macrobiotia. — The narrative of Genesis about the long lives of the patriarchs has very frequently

led to the collation of the ages of persons who have lived to a very great age. Lord Malahide is inclined to give credit to the great number of cases of recorded longevity occurring among the inscriptions recovered from old Roman graves in Algeria and Tunisia. Mr. Renier has published a collection of these, and a still more complete series is by Mr. Willman, under the auspices of the Royal academy of Berlin. Upwards of ten thousand inscriptions are thus calendared.

The following is a list from Numidia: —

101	14 persons.	110	5 persons.
101	10 "	115	4 "
102	2 "	120	3 "
103	1 person.	125	2 "
105	7 persons.	126	1 person.
106	1 person.	127	1 "
107	1 "	131	1 "
108	1 "	132	1 "

At Mastar, a small town, the cemetery yields the following: —

Anna R.	101	Marcela	120
Coecilius	100	Januarius	101
Gargilius	103	Martialis	105
Granius	110	Another	115
Ninava	115	Jussata	105
Petreia	115		

Lord Malahide, in order to show the credibility of these figures, speaks at length upon the duties of the Roman censors. — (*Journ. anthrop. inst.*, xii. 441.)

J. W. P. [103

The Pawnees. — Mr. John B. Dunbar of Bloomfield, N.Y., has brought together in a quarto pamphlet his researches into the Pâni family of North American Indians. The tribes embraced in this group are the Pawnees, Arikaras, Caddos, Huecos or Wacos, Keechies, Tawaconies, and Pawnee Picts or Wichitas. The last five are the southern or Red River branches. A brief account of each of these is given in the first few pages of the pamphlet. The third paragraph is devoted to the Arikaras, and the remainder of the monograph to the Pâni, or Pawnees. A very extensive bibliography of the stock has been collected, commencing with the expedition of Lewis and Clarke, and including the publications of Pike, Long, J. T. Irving, Murray, Hayden, and the reports of the several commissioners of Indian affairs. Earlier notices are found in la Harpe, du Pratz, and Charlevoix.

The name 'Pawnee' is probably derived from *Pá-rĭk-ĭ* (a horn), referring to their peculiar scalp-lock. The original hunting-ground extended from the Niobrara, south to the Arkansas, but no definite boundaries can be fixed.

Mr. Dunbar has collected from various sources the traditions of their origin and migrations (§ 8), their conflicts (§ 9), their census (§ 10), and their later history since the beginning of our century. Considerable space is given to their tribal organization, physical characteristics, social usages, dress, names, lodges, arts, trade, feasts, hunting, war, medicine, mourning, religion, calendar, present condition and prospects. Brief chapters are devoted to the celebrated chiefs, Pitale-sharu, Lone Chief, and Medicine Bull. — J. W. P. [104

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

STATE INSTITUTIONS.

State university of Kansas, Lawrence.

Weather report for June. — The chief meteorological features of this month were the low mean temperature and the abundant rainfall. During the fifteen preceding years, three Junes have been cooler than this, and only one (1876) has had a larger rainfall.

Mean temperature, 71.38°, which is 2.87° below the June average. The highest temperature was 94°, on the 22d and 30th. The mercury reached or exceeded 90° on only six days. The lowest temperature was 48.5°, giving a range of 45.5° for the month. Mean temperature at 7 A.M., 66.22°; at 2 P.M., 80.3°; at 9 P.M., 69.5°.

Rainfall, 7.73 inches, which is 2.80 inches above the June average. There were seven thunder-showers, one of which, on the night of the 11th, continued for six hours, and brought 2.92 inches of rain. The entire rainfall for the six months of 1883 now completed has been 21.80 inches, which is 5.05 inches above the average for the first half-year of the past fifteen years.

Mean cloudiness, 38.56% of the sky, the month being 3.64% clearer than the average. Number of clear days (less than one-third cloudy), 14; half clear (from one to two thirds cloudy), 12; cloudy (more than two-thirds), 4. There were four entirely clear days, and only one entirely cloudy day. Mean at 7 A.M., 42.67%; at 2 P.M., 39.33%; at 9 P.M., 33.67%.

Wind: S.W., 24 times; S.E., 24 times; N.W., 17 times; N.E., 14 times; N., 4 times; S., 4 times; E., 3 times. The entire distance travelled by the wind was 10,737 miles, which is just two miles above the June average. This gives a mean daily velocity of 357.90 miles, and a mean hourly velocity of 14.91 miles. The highest velocity was 45 miles an hour, on the 22d and 23d. The thunder-storm of the 11th was ushered in at 11.30 P.M. by a very strong 'straight' wind, which unroofed a portion of the Central school building at Lawrence, but was in no sense a tornado.

Mean height of barometer, 29.028 inches; at 7 A.M., 29.050 inches; at 2 P.M., 29.013 inches; at 9 P.M., 29.020 inches; maximum, 29.217 inches, on 14th; minimum, 28.671 inches; monthly range, only 0.546 inch.

Relative humidity: mean for month, 74.3; at 7 A.M., 83.1; at 2 P.M., 57.7; at 9 P.M., 82.1; greatest, 97, on 23d and 24th; least, 37, on 14th.