THE CHEIROMELES.

BY FREDERIC A. LUCAS.

If the curious bat (*Cheiromeles torquatus*) shown in the accompanying engraving is not the most singular member of the order cheiroptera, it certainly has very few rivals. The skin is thick, almost naked, and marked with deep wrinkles, so that the animal has something the appearance of a diminutive pachyderm. Like the other members of the small sub-family to which it belongs, the cheiromeles has long, narrow wings which fold compactly up, very little membrane in front of the fore arm, and feet entirely free from the wing membrane. It thus has greater freedom of movement than bats usually possess, and the creature can crawl so rapidly over the ground that it is not an easy matter to pick it up. The first toe is quite separate from the others, and is furnished with stiff hairs along the outer edge. The thick round tail is free for more than half its length, and the interfemoral membrane is movable upon it, thus allowing the extent of surface exposed to the air to be increased or diminished at will, and probably aiding the animal in its rapid turns while in pursuit of the insects on which it lives. The lips are thick and extensible, and the teeth sufficiently large and sharp to crush with ease the hardest beetles. Beneath the neck, running from shoulder to shoulder, is a deep fold or sac, which receives an oily secretion from glands situated in the upper pectoral muscles But the most peculiar feature of the cheiromeles, and one not found in any other species of bat, is a sort of inverted pocket situated beneath either arm pit, formed by a fold of skin running obliquely downward and inward from the elbow. Dr. Dobson suggests that these pouches are to support the young, which otherwise would be unable to maintain a hold on the naked body of its mother during flight. The mammæ are situated at the upper end of these "nurse pouches." As both male and female have these pockets it is probable that when two young are born the male takes charge of one. This bat is nearly eight inches in length from nose to tip of tail, and twenty-two inches across the wings. It is of a dingy lead color, and dwells in holes in trees. Although not at all common, the cheiromeles has quite an extensive range, being found in Java, Borneo, Sumatra, and the Malay Peninsula.

CHEIROMELES TORQUATUS.

THE HORNED SCREAMER.

The horned screamer (*Palamedea cornuta*) is found in Central Brazil and northward in Guinea and Columbia. On account of the horn on the crown of its head, the thickly feathered wings, short head, and neck feathers, it will be recognized as a representative of the family of horned birds.

The horn, fastened only in the skin, rises from the brow about five-eighths of an inch from the root of the bill. It is slender and from four to six inches long, standing nearly erect, but slightly curved toward the front. Its diameter at the root is one-eighth of an inch, and it may properly be compared to a catgut string

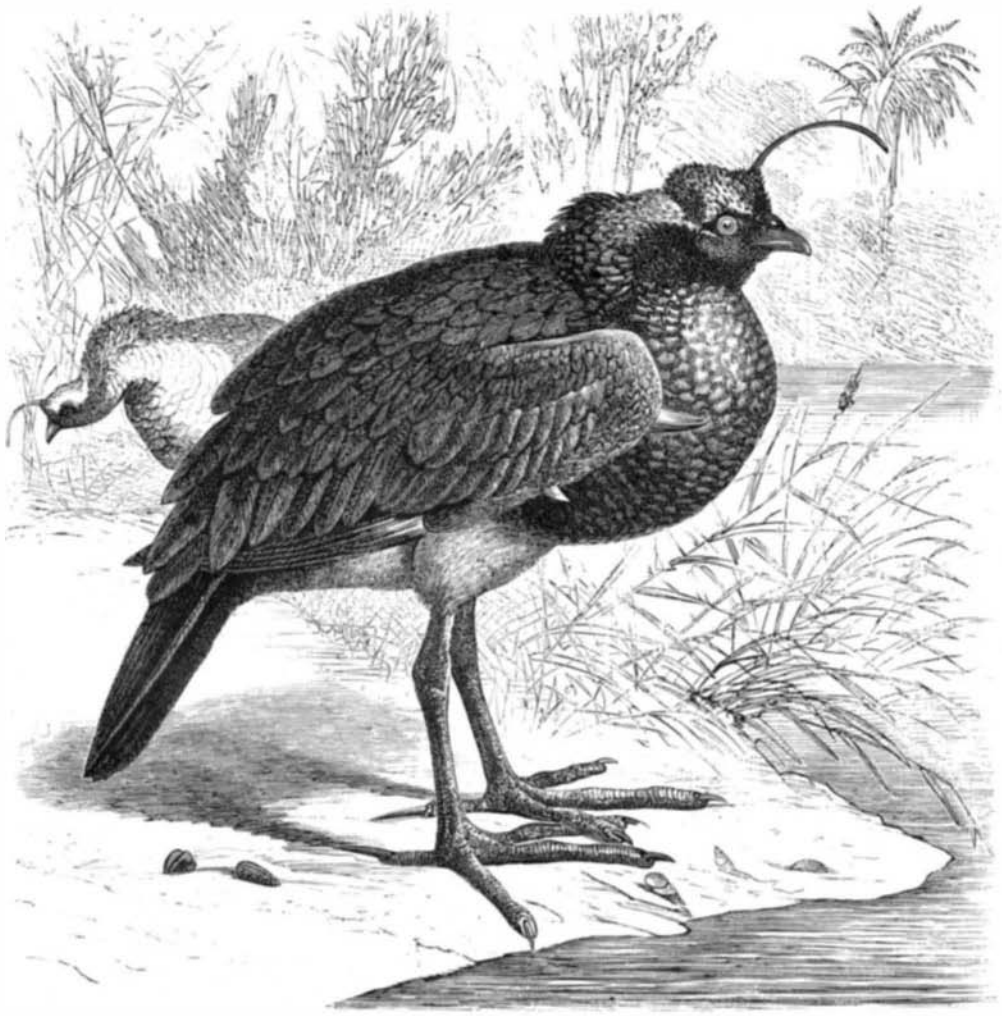
The horned screamer is armed with two spurs on each wing; the upper one on the bend of the wing is triangular and very pointed. It is about nine-sixteenths of an inch long and almost imperceptibly curved outward. The lower one is only five-sixteenths of an inch long, almest straight, and very strong.

The soft velvety feathers of the upper part of the head are of a light gray, black toward the tip. The throat, neck, back, breast, and tail are blackish brown, the shoulders and large wing coverts are of a glistening metallic green, the lesser wing coverts a muddy yellow at the roots, the upper half and the upper part of the breast are a clear silver gray with a broad edge of black, the rump and belly are pure white. The eye is orange colored, the bill blackish brown, white at the tip. The horn is light gray, the feet a darker gray.

The horned screamer is a large and beautiful bird, about the size of a common turkey, and is an ornament to the primeval forests of Brazil. In traveling from the south to the north it is not generally found until the sixteenth degree of south latitude is reached, where it may be seen in large numbers.

It lives only in wilds far from the habitations of men, where its peculiar voice may be frequently heard; it has some similarity to the notes of the wild wood-pigeon, but is far louder and accompanied with guttural tones, and is uttered so suddenly and with such vehemence that it has a very startling effect. Sometimes one can catch a glimpse of these birds as they walk proudly upon the sand banks near the rivers. If they are approached they fly up and resemble in the broad surface of their wings, their coloring, and flapping, the urubu, or black vulture. They perch upon the top of thickly foliaged forest trees, and though they can seldom be seen, their loud, shrill voices indicate their whereabouts. In the brooding tiny they are found in pairs, sometimes four or six individuals joining together. The food of the horned screamers consists chiefly of vegetable substances, such as the leaves and seeds of aquatic plants, in search of which they wade through the morasses. Their flight is strong and easy, their walk erect and bold, and their mien lofty like that of the eagle, Their nests are found upon the ground in the forest marshes not far from rivers; they contain two large white eggs, and consist only of a few twigs. The young follow their parents almost as soon as hatched. Their flesh is not edible. Their quills are often used for pens.

The horned screamers when domesticated are confiding and obedient, associate with fowls, and are peaceable when unmolested. They always place themselves on the defensive toward dogs, and know how to use the spurs on their wings to such purpose that they put them to flight with a single blow.



THE HORNED SCREAMER—(*Palamedea Cornuta.*)

Wool Velvet.

According to *L'Ingénieur Universel* an extremely novel and interesting process has recently been discovered by M. Puech, of Mazamet, France, by which the wool on sheepskins may be transformed into velvet. Up to the present time sheepskins tanned with the wool on have only been used for mats, linings of coats, etc., and the wool not having been subjected to any preparation, is always matted or curled. Seeing that the innumerable fibers are naturally disposed in a most regular and perfect order, eminently fit for velveting, M. Puech conceived the idea of cleansing the skin and wool of all impurities, and of so preparing and dressing them that the hairs would be well preserved and not entangled one with the other, the occurrence of the latter contingency being, of course, fatal to the success of the operation. After long and continuous experiments success has been achieved in the following manner: The *modus operandi* is divided into ten principal operations, the 1st, 2d, 3d, and 4th relating to the complete scouring of the skins on the wool side and cleaning them on the flesh side, and the 5th, 6th, 7th, 8th, and 9th to tanning and preparing the skins so that the perfect adherence of the wool to the skin is insured; finally, by the 10th operation, the skin is submitted to special machines for preparing the wool like velvet.

The following are the ten numerically arranged and successive operations referred to as constituting the process: 1st. An ordinary water bath is prepared at a temperature of from 45° to 50° Cen., to which a scouring substance of some sort is added, such as crystal or soda salt, soap, and so forth, in which the skins are steeped. 2d. If dry skins are operated on, such as come from America or other foreign country, they are steeped eight to ten minutes, but for fresh or recently slaughtered skins three or five minutes will suffice. The skins are then passed to a pressing roller of sufficient power to separate the burrs, yolk and other impurities. 3d. The skins are then as quickly as possible and while still warm submitted to a beating machine. The object of this beating operation is to purify them of all foreign matters, and at the same time to wash them thoroughly with cold, tepid, or hot water, which is made to fall in abundance between the drum of the machine and the apron supporting the skin. 4th. The skin on the flesh side is then passed to this same beating machine, which cleanses it, renders it more supple, and disposes it to receive the tanning matter. 5th. The skins thus prepared are steeped about one hour in tepid water, or four to five hours in cold water, which operation completes the softening. 6th. They are then passed to a pressing roller to extract all the water and leave fifteen to twenty per cent of moisture. 7th. On the flesh side is applied, either by hand or mechanically, one of the known drugs composed *ad hoc*, constituting the tanning matter. In order that the action on the leather may be complete the skins are placed in piles for five to ten hours, after which they are hung up to dry. 8th. The leather is now moistened with a rag or sponge, and the skins are replaced in piles for five to ten hours to soften the leather and permit of cleaning the flesh side. 9th. The hides are stretched and are then passed to the softening iron, always on the flesh side, and the skins are scoured and tanned. There now remains only the 10th, or velveting operation, which is effected thus: By the scouring and beating system the staple of the wool is perfectly preserved and each fiber is in place. It then suffices to pass the skin on the wool side to the gig machine, which replaces all the staples where they had been displaced in the tanning operation, and causes the skin to part with what little tanning drug it may contain in the wool. After this the skins are passed to the dressing machine, which commences to dress the wool, cards it also a little, and prepares it for velveting. The skin on the wool side is then gently sprinkled and beaten with a rod by hand or mechanically. This is one of the most essential operations, as the wool being then damp the rod raises it and hastens the preparation of the velvet. The skin has now to be dried and sheared with cloth shears or other apparatus having the same effect, and this completes the process.

If it is desired to color the velvet, it is after the 4th operation that the dyeing takes place, the other operations then succeed as has been described. If the color necessitates boiling or temperature approaching it, which would be inconvenient to an untanned skin, the operation is performed after the 7th operation, and this 7th operation is renewed after dyeing and then followed by the subsequent operations.

Animal Reasoning.

A correspondent of *Nature*, writing from Cambridge, Mass., says: A lady, a friend of mine, was at one time matron of a hospital for poor women and children which was maintained by subscription. One of the inmates was a blind girl who was there not as a patient, but temporarily till a home could be found for her. She had learned to feed herself, and at meal times a tray containing her dinner was placed on her knees as she sat in a comfortable chair for her special convenience in feeding herself. One day while she was eating, the pet cat of the establishment placed herself before the girl and looked long and earnestly at her, so earnestly that the matron, fearing the animal meditated some mischief to the girl, took her out of the room. Again the next day, at the same hour, the cat entered the room, but this time walked quietly to the girl's side, reared herself on her hind legs, and noiselessly, stealthily reached out her paw to the plate, selected and seized a morsel that pleased her, and, silently as she came, departed to enjoy her stolen meal. The girl never noticed her loss, and when told of it by her companions laughed very heartily.

It is evident that the cat from observation had entirely satisfied herself that the girl could not see, and by a process of reasoning decided she could steal a good dinner by this practical use of her knowledge.

The White Alligator.

Writing to the *World* from Ca-Manos-Alto, at the foot of the great rapid of the Rio Negro, Brazil, the explorer, Mr. Ernest Morris, says:

Over one of the camp fires the crew are roasting with boisterous merriment a live alligator (*Jacaré tinga*), about five feet long. When I asked why they did not kill the animal before roasting, the pilot, who is always the spokesman of the party, answered that it would spoil the meat. The white alligator is highly relished by both whites and Indians. It differs entirely from the *Jacaré assu*, or large alligator, rarely attaining five feet in length, and is distinguished from the larger species by its pointed nozzle, somewhat rounded tail, whiter color, and its freedom from the *acatinga* (or smell). Though it is found throughout the whole course of the Amazon, it abounds more in clear-watered rivers and creeks. I have often found this alligator in streams of the high hills, miles away from any river or lake, and have frequently seen the skulls and bones in the forest. That it travels far and well on land there can be no doubt; and the Indians say that its eggs are deposited in the forests. The flesh resembles veal in appearance and has a fishy taste.

The Excretion of Lime.

Many investigations have been directed to the determination of the amount of lime excreted in various pathological states, and many observations exist of changes in the excretion. One of the earliest observations was that of Prout, relating to the phosphatic diathesis, which was recognized by the deposit in the urine. Later an increased excretion of earthy phosphates was assumed to exist in many diseases of the nervous system and kidneys, and a diminished excretion in some other diseases. Beneke studied the mode of formation of oxalate of lime in the organism, and Senator has directed attention to the variations in the amounts of lime excreted in various conditions. The last contribution to the subject is contained in an article in the current number of Virchow's *Archiv*, by Dr. Schetelig. The method of estimation which he has employed is the precipitation of the lime by oxalic acid; the precipitate was dried and dissolved in hydrochloric acid, and the lime precipitated by soda. The phosphoric acid was estimated by means of acetate of uranium.

The first question to determine was the amount excreted by normal individuals, since the statement of different authorities on this point differ largely, varying from 100 to 500 milligrammes. Experimenting on himself during eight days, the excretion was found to vary from between 350 and 500 milligrammes. It is greatest, like the other solid constituents, in the morning urine, and, when no breakfast was taken, the minimum was found in the urine passed just before the mid-day meal. Five hours later the quantity was greater; ten hours after the meal it was greater still. The excretion seems thus to bear relation to the material taken at a meal, and to the process of intestinal digestion. In starvation, accordingly, the excretion of lime almost ceases. On two days the mid-day meal was omitted, and on a third only an extremely small quantity of solid food was taken; the morning excretion of lime fell to an average of 70 milligrammes, and once only 35 milligrammes were noted.

The long delay after food before the amount of lime is increased in the urine makes it probable that it passes through the organism in some other path than, for example, that taken by the haloid salts, which find their way into the urine in a very short time. From a long series of observations, the conclusions were drawn that carbonate of lime, even when given in very small quantities and with much water, is quickly absorbed and appears in the urine. The lime phosphates of meat are, to a small extent, transformed into chloride or directly absorbed, but for the most part pass with the albumen into the small intestine and into the lymphatic vessels, but need the presence of the hydrochloric acid of the stomach for their preparation for absorption. The ingestion of water assists the passage of the lime into the vascular system in a very striking manner. No pathological increase in the excretion of lime could be demonstrated in chronic diseases of the thoracic organs or of the central nervous system, and seems to be improbable. The amount of phosphates in the urine is apparently regulated by the process of intestinal digestion and absorption, rather than by the conditions of the cell life of the body. The best means of counteracting the effect of the ingestion of lime is the free administration of water and chloride of sodium, or of hydrochloric acid.—*Lancet.*

Elasticity of Wires.*

The experiments described in this paper form a continuation of experiments undertaken in connection with the work of the Committee of the British Association for commencing secular experiments on the elasticity of wires.

Long-continued application of stretching force increases to a very great extent the tensile strength of soft iron wire. Thus in experiments described to the British Association in 1879 (see report of the committee just referred to), a particular very soft iron wire was shown to have a breaking weight 10 per cent higher, if the weight necessary to break it is applied half a pound at a time per day, than it has if the breaking weight is applied half a pound at a time at intervals of say two minutes. It was found, also, that this wire, quickly broken, extends before breaking by as much as 25 per cent of its original length; whereas if the application of the stress is very slow, the extension is not more than 5 or 6, or perhaps 8 per cent. Further experiments have been undertaken on this subject, and are still in progress.

Using a continuous arrangement for applying the stretching weight and employing some very soft iron wire which had been specially prepared, and which was used in former experiments, the greatest weight which could be rapidly put on the wire without breaking it was determined. It was found that with a weight of 41 pounds gradually applied in 6¼ minutes, the wire stretched by 24·4 per cent of its original length, and broke 18 minutes after the weight was put on. With the same weight 41 pounds applied in 6¾ minutes, the wire stretched 22·1 per cent and broke in 24 minutes. With 41 pounds, however, applied in 7¼ minutes, the wire stretched 18 per cent and did not break. This weight, therefore, appeared to be just as much as the wire would bear with this method of applying the weight. Accordingly it was applied to a great number of wires for different lengths of time for the purpose of hardening them, and arrangements have been made for keeping a number of wires for very long times with this stretching force applied to them. The amount of extension produced by the application of the hardening stress was observed in each case.

After the hardening stress had been applied for a certain time the additional weight necessary to break the wire was determined, and also the additional elongation before breaking, which was in all cases almost insensible. The wires seemed permanently set in about forty minutes from the time when the hardening stress was applied. They did not alter in length till just before they broke, when they generally stretched 1 or 2 millimeters on a length of about 1,800 mm. The following table shows some of the results out of a great many that have already been obtained.

Length of wire used.	Hardening stress applied in pounds.	Time taken by continuous machine in applying the hardening stress in minutes.	Extension produced by application of hardening stress in per cent in original length.	Duration of hardening stress in hours.	Total breaking weight after hardening
150 cm.	41	6¼	24·4	Broke with 41 lb.	
"	"	6¾	22·1		
"	"	9½	18·7	24	47·44
"	"	7	17·2	27	47 5
"	"	8	17·3	117	48 13
"	"	7½	18·1	490	52 31

Curves have also been obtained and were exhibited to the section showing the extension with gradually applied weights both of a number of wires and of the different parts of the same wire; also curves showing the extension at different intervals of time from the beginning of an experiment in which the wire is running down under a weight sufficient to break it finally.

The author acknowledged the great assistance that he had received from Mr. A. C. Crawford and other students in the Physical Laboratory of the University of Glasgow.

Similar experiments are in progress on wires of copper and tin, and it is intended to test gold wire very soon, as it will probably give interesting results, and results very different from those given by soft iron wires.

The Egyptian Obelisk Presented to New York.

The last act in the history of the obelisk removal was its official presentation to the city of New York by the United States, at the Metropolitan Museum of Art, February 22.

In his presentation speech, Mr. Evarts, Secretary of State, gave some interesting particulars touching the removal of obelisks from Egypt:

"The first was taken by the conquering Assyrian, a monarch of great mark in his time, and remembered through all ages since—known better to us, and more easily, by his Greek name of Sardanapalus. He took an obelisk to Nineveh, the capital of Assyria, when that empire was the mistress of the world; and that movement was, indeed, a movement which embraces many of the important incidents of even a great voyage like this which our obelisk has taken. Although there are no records of the precise method or route of transportation which the Assyrian took for his obelisk, yet it is very apparent that, as it must have been water-borne, it was taken to the Red Sea, then down the Red Sea into the Indian Ocean, then up the Persian Gulf to the mouth of the Euphrates, and thence to Nineveh, beyond the navigation of the river. This route, speaking roughly, must have included some fifteen hundred miles of journeying, and we are somewhat at a loss to understand how the method and vehicles for such a transportation could have existed at that age, we have so little record of them. But as the obelisk undoubtedly got to Nineveh and could not go across the desert by land, it must have made this circuitous route for upward of fifteen hundred miles.

"The next conqueror that assumed to take obelisks from Egypt was Rome in the time of the emperors. They took as many as fifteen, one after another, and twelve now remain in Italy. This brings us to the period close upon the Christian era; and in the time of the famous Cæsar, Julius, and on through his successors, Egypt, subject and abject, yielded up these treasures of its art and of its pride to a conquering spoiler.

"Now came the Empire, with Byzantium as its capital; and it, too, demanded from the wealth of Egypt the contribution of an obelisk to mark the domination of this city. Byzantium, now Constantinople, contains the obelisk then taken; and this closes the transactions, or transportations, in ancient times. All subsequent movements have been within this century. The French and British, as we know, made Egypt a battlefield at the commencement of this century. Egypt, recognizing its obligations to England, as early as 1819 had offered an obelisk to England, the great power of the earth. But the difficulties of transportation and the expense seemed so serious to the mother country that that gift remained lying on the sand at Alexandria; nor was any movement made for its transfer until the year 1877—completed in 1878. The height of English ingenuity and experience in architecture of naval vessels, in navigation, and in engineering, had only taught the English that an obelisk could not be carried in the hold of a ship; and the experiment was made of building a vehicle around the obelisk that could float it and itself and be towed by a steamer—giving this abundant opportunity of safety, between the sinking of the obelisk and the sinking of the tow; the tow might cut loose from the obelisk and leave nothing therefore for the chance of loss of life. The experiment was not such as to encourage imitation by us, even if Captain Gorringe had not had that faith in a ship which had been his cradle from his youth, that if it could carry all the men and all the armor and all the cargoes that modern civilization burdens ships with, it could carry an obelisk. The caisson, or whatever it was called, in which the English obelisk was inclosed, was abandoned in mid-ocean, and the experiment was delayed—delayed for fifty years and more from the time the gift was made until the courage and the skill were present to undertake it. Some adventurers at sea picked it up, brought it into London, took it into a Court of Admiralty, and received £5,000 for executing what the original arrangements had failed to do.

"The French obelisk was given in 1823 or 1824, by the Egyptian Government, doubtless in execution of a readiness on their part to favor the plan of Napoleon, to make that transfer as a part of his triumph to ornament his capital. In 1831, just fifty years ago, Louis Philippe undertook the transportation, and placed the monolith where so many good Americans have seen it in Paris, in the Place de la Concorde. It is noticeable that the expense of this transfer across the Mediterranean, or around by the Bay of Biscay, whichever way it went, cost nearly $500,000, quite five times as much as our enterprise, under the lead and the execution of Lieutenant Commander Gorringe."

The following statement of the transportation expenses of our obelisk was furnished by Lieutenant Commander Gorringe:

Net cost and expenses of removing, transporting, and erecting the New York obelisk	$73,844 03
Net cost and expenses of removing, transporting, placing, and repairing the pedestal, steps, and base	28,732 00
Total net cost	$102,576 03

This sum does not include the cost and expenses of the steamer, which must be recovered from her sale. The word "expenses" is used to designate and include amounts that have been paid for the use of the money needed to carry on the work. These amounts aggregate $15,973 03. Deducting this sum from the total net cost, the actual cost of lowering and removing, and transporting 5,382 miles by water and 11,520 feet by land, and erecting the New York obelisk and its pedestal and base, is $86,603.

The entire cost of the undertaking was defrayed by William H. Vanderbilt. The credit of carrying it out under great financial and political difficulties, at his own personal risk, is due to Commander Gorringe.

* Strength and Elasticity of Soft Iron Wires. Abstract of a paper read at the British Association, by J. T. Bottomley, M.A., F. R.S.E.

Nasal, Pharyngeal, and Bronchial Catarrh.

The complaints above named are very prevalent throughout all those regions of this continent where sudden changes in temperature are frequent. Acute attacks are, in popular language, called "cold in the head," "sore throat," and "cold on the lungs." The latter is, however, most generally confined to the bronchial tubes, and consequently the popular name is a misnomer. We find in the "Proceedings of the Medical Society of the County of Kings, N. Y.," for February, 1881, a very extended discussion of the relation of locality to the prevalence of this class of diseases. It is supplied in a report of the Committee on Hygiene of the society, which has made an apparently successful attempt to determine whether catarrhs are more prevalent in Brooklyn than New York, this being a popular notion.

To local readers it will be of interest to know that this notion is not based on facts, catarrhal affections being, in the opinion of the committee, equally common in both cities. This opinion is based upon statements supplied by the oldest and best physicians in both New York and Brooklyn. For the general reader, however, the conclusions of the committee have value beyond the decision of the main point in issue.

We may properly state here that the course pursued to gain the required information was systematic and thorough. It embraced inquiries into the meteorological conditions of both cities for a number of years, an examination of the received authorities in printed works upon the relations of catarrh to climate, locality, and individual constitution and temperament, inquiry into the tendency of repeated catarrhal affections to induce tuberculosis or real pulmonary consumption, and interviews with local physicians of character and large experience.

It was found that the climatic difference between the two cities is very slight indeed.

It was also determined that no real change of climate has occurred along the line of Atlantic coast cities for indefinitely long periods of time, although, apparently, there have been brief cycles of heat and cold, of moisture and of dryness, succeeding each other under the operation of some unknown law.

CAUSES OF PHARYNGEAL CATARRH.

These, as enumerated by various authors, are: "Personal idiosyncrasy, straining the voice as in shouting. As secondary to nasal catarrh, indiscretion in leaving off clothing, or in getting feet wet; rude changes in the temperature of the air; local irritants, as tobacco, spices, and hot drinks; certain atmospheric causes as yet unknown; thus, in spring and autumn catarrhs often prevail *endemically*. The same causes (perhaps, *e. g.*, pollen) sometimes operate to produce the epidemic varieties: *e. g.*, influenza and hay fever are symptomatic of certain exanthemata.

"Generally 'moist and cold climate with frequent and sudden and severe variations of temperature.'

"Biermer draws attention to chilly winds with increased moisture.

"Lebert noticed this before, as also the effect of sudden depressions of temperature. He finds that the 'fair weather' years are *not* the best, but those when the transitions of the seasons and the changes of the temperature are *least marked*. He has also proved that the extremes of temperature and pressure produce less trouble than *sudden* changes. He shows that in Switzerland 50 per cent of all catarrhal bronchitis is in the first *four months of the year*. Heller obtained nearly similar results at the Vienna Hospital."

NASAL CATARRH.

The like causes produce nasal catarrh, except such as in the above enumeration relate to exercise of the voice and sequelæ of nasal catarrh.

CAUSES OF BRONCHIAL CATARRH.

"The sudden cooling off of the whole body, or a part of it, *i. e.*, the process of 'taking cold.' 'Inhalation of dust,' affections so well shown up by Hirt. Catarrhs from inhalation follow the following order of frequency: 1st. Inhalation of *vegetable* dust, next metallic dust, then that of animal origin, and least noxious is mineral dust. Inhalation of gases and vapors—vapors most often of nitric and sulphuric acids—then of hydrochloric acid. Catarrh from iodine inhalation is very rare. Hirt has noticed *marked tolerance* of these *irritants after a few attacks of catarrh*. He finds a few vapors that are not only innocuous, but seem to diminish a disposition to catarrhal disease, and even to hasten the favorable termination of an already existing catarrh. In this class belong vapors from oil, from glue, burning tar, and *salt air*.

"The theory that an undue amount of ozone in the atmosphere is a cause of catarrhs has not been established. During the prevalence of the epizootic or influenza among horses a few months since, the daily tests at Central Park showed almost an entire absence of ozone from the atmosphere."

The committee expresses the opinion that "though climatic and city influences have much to do with the creation of catarrhs, yet defective heating, lighting, airing, sunning, and drainage of houses, with improper views as to air, clothing, bathing, and exercise, are the main causes."

The effect of change of location upon catarrhal affections seems very pronounced.

The committee asserts that a mere change of residence "from New York to Brooklyn, or from Brooklyn to New York, or accompanied with better food, more healthy and cheerful surroundings, may relieve a catarrhal patient; and that a change, with or without the above acquirements, from an exposed part of one city to a protected part of the other, from one house or section in either city to another house or section in the same, may likewise afford relief."

Those parts which are considered "exposed," in contra distinction from "protected" portions of a city, are those in which cold winds have more free access to exert their chilling effects.

Seaboard cities, though not, in general, considered favorable places of resort for catarrhal and consumptive patients, may yet afford benefit, provided the change is attended by increased comforts, enjoyment, better opportunities for treatment, and attention to personal hygiene.

Color Relations of Metals.

In a paper on the color relations of copper, nickel, cobalt, iron, manganese, and chromium, lately read before the Chemical Society, Mr. T. Bayley records some remarkable relations between solutions of these metals. It appears that iron, cobalt, and copper form a natural color group, for if solutions of their sulphates are mixed together in the proportions of 20 parts of copper, 7 of iron, and 6 of cobalt, the resulting liquid is free from color, but is gray and partially opaque. It follows from this that a mixture of any two of these elements is complementary to the third, if the above proportions are maintained. Thus a solution of cobalt (pink) is complementary to a mixture of iron and copper (bluish-green); a solution of iron (yellow) to a mixture of copper and cobalt (violet); and a solution of copper (blue) to a mixture of iron and cobalt (red). But, as Mr. Bayley shows, a solution of copper is exactly complementary to the red reflection from copper, and a polished plate of this metal viewed through a solution of copper salt of a certain thickness is silver white. As a further consequence, it follows that a mixture of iron (7 parts) and cobalt (6 parts) is identical in color with a plate of copper. The resemblance is so striking that a silver or platinum vessel covered to the proper depth with such a solution is indistinguishable from copper.

There is a curious fact regarding nickel also worthy of attention. This metal forms solutions, which can be exactly simulated by a mixture of iron and copper solutions; but this mixture contains more iron than that which is complementary to cobalt. Nickel solutions are almost complementary to cobalt solutions, but they transmit an excess of yellow light. Now the atomic weight of nickel is very nearly the mean of the atomic weight of iron and copper, but it is a little lower, that is, nearer to iron. There is thus a perfect analogy between the atomic weights and the color properties in this case. This analogy is even more general, for Mr. Bayley states that in the case of iron, cobalt, and copper, the mean wave length of the light absorbed is proportional to the atomic weight. The specific chromatic power of the metals varies, being least for copper. The specific chromatic power increases with the affinity of the metal for oxygen. Chromium forms three kinds of salts: Pink salts, identical in color with the cobalt salts; blue salts, identical in color with copper salts; and green salts, complementary to the red salts.

Manganese, in like manner, forms more than one kind of salt. The red salts of manganese are identical in color with the cobalt salts and with the red chromium salts. The salts of chromium and manganese, according to the author, are with difficulty attainable in a state of chromatic purity. He thinks these properties of the metals lead up to some very interesting considerations.—*Chemical Review.*

The Electric Lighting of Mines.

At one of the sessions of the American Institute of Mining Engineers, in Philadelphia, the Edison system of electric lighting, as applied to mining, was described by Mr. A. O. Moses. The method adopted is very simple. Wires run direct from the dynamo-electric machines to the different workings, supplying light to the shaft on their way. Each lamp may, if desired, be immersed in water, or may be protected from fracture by a coarse wire screen; the connections can all be made under water, and thus lamps may be put in or out of circuit without the slightest danger from the electric spark.

Far too much importance, the speaker thought, has been attached to the consequences that may arise from leading wires into mines for conveying electricity, notably by such high authority as Mr. Preece, the English telegraph engineer, but his deductions are not sustained by facts.

One of the most important advantages of the electric light in coal mines is in obviating the necessity of hermetically sealing up old or temporarily abandoned workings. Another is their prompt availability at times when light is of the most vital importance, when many lives may be in jeopardy after explosions, and dangers are multiplied on every hand, when everything depends upon immediate and vigorous action; then the weakness of all lamps that require to be fed with air asserts itself.

Dr. Wendell, Horticulturist.

Dr. Herman Wendell, one of the best known pomologists of this State, and owner of one of the largest orchards in the country, died at Hazlewood-on-the-Hudson, February 22, at the age of 70 years. Dr. Wendell was for several years President of the State Horticultural Society, and Vice-President of the State Agricultural Society. His orchard contained from eight to ten thousand fruit trees, every one planted by his own hand.

MECHANICAL INVENTIONS.

Mr. Albert Bonzon, of Santiago, Cuba, has patented a chronograph watch. The invention consists in a wheel rigidly attached to the second hand arbor and roughened on its upper surface, and in a heart cam with a roughened lower surface, which cam is loosely mounted on the second hand arbor and provided with a sleeve carrying the second hand and acted upon by a spring, whereby it can be raised or lowered, so as to come in and out of contact with the roughened wheel. An adjustment screw on the spring acting upon the cam regulates the distance that the end stud of this spring is removed from the heart cam.

Mr. William L. Miller, of Pittsburg, Pa., has patented a reversing and cut-off mechanism, which dispenses with the ordinary link motion. A disk is fitted and fixed on the shaft, and a movable eccentric having lugs which play in slots formed in the disk slides on the flat face of the disk. A sliding collar on the shaft is by links made to shift the eccentric, the weight of the eccentric being counterbalanced to equalize strain on the collar.

Messrs. Orry M. Shepard and William A. Knight, of Evansville, Indiana, have patented a railway time signal, which consists in a novel construction, arrangement, and combination of devices operated by wheels of a passing train, whereby both night and day signals are displayed, retained for a certain length of time in sight, and then gradually changed to different positions.

Mr. Luther C. Baldwin, of Manchester, N. H., has patented an apparatus for drying bobbins which dispenses with the use of boards for arranging the bobbins so that the ends will not touch after they have been painted. An endless belt is substituted on which the bobbins are placed, and which, running slowly, discharges the bobbins at a distance from the point where they are placed on the belt. The paint used being of a kind which quickly dries, the bobbins are discharged finished. A registering apparatus is employed to record the number of bobbins so discharged.

A Railway Station in the Gothard Tunnel.

The daily journals of Switzerland and Germany contain long articles in regard to an underground station in the great Gothard Tunnel, below the village of Andermatt, which has about 800 inhabitants, is situated about 5,000 feet from the sea, and directly over the tunnel. The Gothard Pass and the well-known Furka Pass, leading into the valley of the Rhone, cross here, and it seemed desirable to connect the railroad with the Furka Pass. The design is to cut a slanting tunnel from Andermatt down to the Gothard Tunnel and convey the passengers up and down by means of a wire cable road. At the connections of the two tunnels, restaurants, depots, etc., are to be cut out of the rock. The inhabitants of Andermatt expect to do a very great business, as all the passengers will prefer to leave the train at this novel station and be carried into the beautiful Urserenthal, in which Andermatt is located, by the rope railway. The freight traffic would certainly be increased, but all this will probably not pay the cost of the additional tunnel, which would have to be about 1½ miles long. The idea is a very novel one, and is no doubt deserving of some consideration, but at present it will probably remain idea only.

L. d. V D. E.-V.

Long Voyage in a Small Boat.

According to a correspondent of the London *News*, the sailing boat Il Leone di Caprera, 3¼ tons register, and manned by three Italians, stopped at Las Palmas, Canary Islands, February 9, on the way from Montevideo, S. A., to Naples. The boat had been 95 days on the voyage. She is described as being 27 feet long, 7½ feet wide, 3 feet deep in the center, and 5 feet fore and aft, flush deck, with bulwarks 21½ inches high. In the after part of the boat is a small semicircular space 3 feet deep, in which the helmsman sits. The hold, which is fitted with a number of hermetically sealed zinc tubes, 10 inches in diameter, capable of floating 40 tons, is entered by a hatchway in the after part of the vessel, close up to the semicircular space before mentioned. Here their provisions and water are stored, and there is just enough space to allow one man to lie down at full length. The planks are of cinnamon wood, and the framework is made of algarroba (carob tree.) The two masts are of walnut wood, and fitted in such a manner that in case of a sudden squall they can be lowered almost instantaneously. When in 48° longitude and 30° latitude the boat was struck by a heavy squall, and was thrown on her beam ends, the tops of the masts being forced two or three inches under the water, but she raised herself almost instantly, and suffered no damage. The commander was Capt. V. Fondacaro, an experienced navigator.

In Illustration of Amœboid Movements.

The curious movements of the lowest forms of life are illustrated by Dr. Haycraft with a simple mechanical contrivance, which will be found useful in the classroom. He takes an India-rubber ball, perforated with a number of small holes, fills it with colored albumen (white of egg), and immerses it in a solution of sugar of about the same density as the albumen. A gentle pressure applied to the ball forces out the albumen in finger-like processes, which are retracted when the pressure is relaxed, thus clearly imitating the extension and retraction of the amœboid processes of protoplasm familiar to all microscopists.