The Soaring Birds.

In a short paper under this title put forward by Mr. I. Lancaster, of Chicago, an attempt is made to explain the equilibrium of soaring birds by the mechanical action of currents of air ou inclined planes. A horizontal air current, meeting the inclined plane of the bird's wings, is resolved into two forces, one in the direction of the inclined plane and one at right angles to it, so that the creature when poised in mid-air may be said to be continually sliding down an upward current of air. In test of this theory, practical observations were made on the southwestern coast of Florida, where soaring birds are somewhat abundant. On one occasion, a score of light gray pelicans rose in the air and floated in the vicinity for several hours, offering an excellent opportunity for studying their motions. One of the birds had at first some difficulty in obtaining a position, but in the end maintained a steadier poise than any of the others. The flock was about thirty feet distant from the observer, and their wings were apparently perfectly rigid. Finally, one of the birds rose steadily in the air at the rate of about ten feet per second until a mile or more above the sea. A study of the conditions under which this equilibrium and ascent were accomplished leads Mr. Lancaster to give the following quantitative analysis of the forces involved:

Taking for instance a bird of eight pounds weight and a breeze blowing in a horizontal plane at the rate of twenty miles an hour, or about thirty feet a second, the direction of the wind will be changed by the inclination of the lower surface of the wings from horizontal to vertical. There will then be eight pounds falling thirty feet per second, or 240 foot-pounds as the motive power. This is supposed to raise the bird ten feet per second against gravity, which will require a force of eighty foot-pounds. Subtracting this amount from the available energy, the 160 foot-pounds left over are to hold the bird against the wind and compensate for lost work. The problem is one of considerable interest, and particularly if its solution, as seems not unlikely, has any bearing upon the question of aerial navigation. The explanation offered is not satisfactory in several particulars, for the assumption that the entire force of an air current is changed by the bird's surface from horizontal to vertical is not warranted, nor does it account for the motion or poise of soaring birds during a period of calm.

Ostrich Farming in California.

During the Transvaal war, the South African ostrich ranch of Dr. Sketchly was devastated by Boers and Zulus, and it is to this circumstance that the now flourishing ostrich ranch near the town of Norwalk, 21 miles south of Los Angeles, owes its origin. Dr. Sketchly concluded that southern California might afford both the climatic and law-abiding qualifications necessary for successful ostrich farming, and something less than three years ago started his enterprise with twenty-two birds, ten males and twelve hens, brought from the Cape. He has raised forty birds on the new ranch, and has succeeded so well that he feels the industry to be well established.

The novelty of the culture brought so many visitors to the ranch that it was found necessary to charge an admittance feet of fifty cents to prevent too great an interruption. All dogs are rigorously excluded, or, if they find entrance, are speedily put out of the way; for even rotten ostrich eggs are valued at $2, and good ones from $50 to $100 apiece, so that egg sucking is very undesirable. Of the two hundred acres included in the ranch, eighty are sown to alfalfa, thirty are in corn, and the remainder devoted to the pens, corrals, and other purposes. The sixteen months old birds are kept by themselves in a separate corral. They are six feet high, quite timid, and regain an abundant and glossy plumage three months after being plucked. A little over a year old these chicks produced feathers two feet long—a record unequaled even in Africa. It requires seven months for the new plumage fully to mature.

The adult birds are kept in pairs. The hens are of a speckled brownish color, while the males are a glossy black, with one row of magnificent white feathers on wing and tail. When wild, the birds depend upon their speed for protection, as they can readily outrun the fastest racehorse; and when cornered, their silly habit of hiding the head to escape danger is well known, and furnishes the object of many a disparaging comparison. In captivity, however, they are ferocious and dangerous. Their mode of attack is invariably by kicking, and the immense claw at the end of one of the two toes is an ugly weapon at the command of such muscular legs. When enraged, they make no attempt to jump over the fences surrounding their quarters, but are able to brush them away with little effort. The wings seem to be used only as a steering apparatus, to carry the bird around corners and sharp curves.

In rearing the young, the ostrich manifests much affectionate solicitude. Each pair is expected to hatch three broods annually. The hens average fifteen eggs at a sitting, and occasionally have as many as thirty. The period of incubation lasts about six weeks, and the week-old chicks are as large as good sized turkeys. Patent incubators were formerly used, but better results are now obtained by allowing the birds to multiply in the natural manner.

The digestive powers of the bird are proverbial. At the California ranch they are allowed to exercise themselves on nothing more indigestible than an unlimited supply of pebbles. In addition to these, the daily ration of each bird consists of about fifty pounds of cut alfalfa and a little corn. An artesian well supplies them with pure water.

The ranch is operated by a company, which is reticent about its financial affairs. As a second ranch of three hundred acres has been purchased, and Dr. Sketchly is soon to go to the Cape for more birds, the enterprise is believed to pay something beyond its expenses. The Cape Government has become jealous at this transfer of its monopolized industry, and has imposed an export duty of $500 per bird. When this is added to the long carriage and first cost, the average cost of a pair at Los Angeles is at least $1,500 to $2,000. In mentioning the possible profits of the culture, Dr. Sketchly instanced a trio of birds in South Africa which yielded in one year from offspring and feathers a total revenue of $30,000. If the supply does not increase too rapidly for the demands, the profits should not be less than this in California. Labor is probably much higher than in Africa, but the home producers have the advantage of a 35 per cent ad valorem tariff. The artificial treatment of the feathers, such as dressing, curling, and coloring, is carried on chiefly in New York and Paris.

Ensilage of Mulberry Leaves.

During the silkworm rearing season in Northern Italy, a large quantity of mulberry leaves are sent by rail from one place to another, and in many cases the railway administration run special night trains for this purpose. The leaves are packed loosely in sacks, and often arrive at their destination far from fresh, and consequently, if not totally unfit, at all events cannot afford a wholesome food for the nourishment of these insects. An experiment was made during the present season, by a silk producer in Lombardy, in sending the leaves compressed, and for this a bale was made, weighing 116 kilos, by placing the leaves between two round pieces of board (in this case the bottoms of barrels), and compressing them in an ordinary wine press; the bale was then firmly secured with iron wire. By some oversight, this bale of compressed leaves, made on the 23d of May, was not forwarded to Milan, and from thence to Niguarda, until the morning of the 30th, and consequently it did not arrive at its destination until later. On opening the bale, the leaves, with exception of about two inches in thickness round the outside, were found to be perfectly fresh and sweet, and even these were only faded, and found to be not unfit for food. This is a conclusive proof that the nutritive qualities of the leaves can be preserved for some time, if compressed, and the air thus excluded from them; care, however, must be taken not to crush them and injure their tissues by excessive pressure. From that it would appear that a system of ensilage might be adopted with advantage for preserving mulberry leaves in the same way that it is for forage. Another advantage of such a plan would be that the leaves so compressed would be reduced in bulk, and consequently fewer trucks would be required to carry a given quantity of leaves than there is in the ordinary way; and by ensiling the leaves grown on the warmer side of the Apennines, as for instance on the "Riviera" of Genoa, etc., it would be possible to supply the silkworm rearers of Piedmont and Lombardy during backward seasons, or when, from other causes, the leaves are scarce and expensive.

Cocaine a Cure for Seasickness.

Dr. Manasseine, of St. Petersburg, gives an interesting account of the employment of cocainum muriaticum in seasickness (*Berl. klin. Wochenschrift*, August 31, 1885). He argued from its usefulness in the vomiting of pregnancy that it would likewise be of value in this bugbear of ocean travel. He made a voyage himself in order to test the drug, and, finding among his fellow passengers a man and a woman who were especially prone to the malady, made the following observation: Upon embarking, he administered to each every two or three hours a teaspoonful of a solution containing two and a half grains of muriate of cocaine in five ounces of distilled water, with the addition of a sufficient quantity of rectified spirits of wine. In spite of very rough weather for a period of forty-eight hours, both individuals escaped sickness for the first time in their lives. He also treated successfully a six year old child after it had begun to be sick, and a girl eighteen years of age who had been sick for twenty-four hours before the cocaine was given. Her case being severe, she was given a double dose every half hour, and the result is described as being "truly magical." She remained well during the rest of the voyage. Similar results followed in three milder cases. The writer thinks it justifiable to infer that in this drug we have a certain and harmless remedy against seasickness.

PHOTOGRAPHIC NOTES.

Glacéing Gelatine Paper Negatives.—When gelatine paper is used in the making of paper negatives, it is desirable to dry the paper in such a manner that the gelatine surface will present a smooth appearance like glass, in order that the sensitized albumen paper, upon which the positive print is made, may be in perfect contact in the printing frame. Two simple methods are employed. After the manipulation of preparing a paper negative is finished, the latter is slightly drained and laid face down upon a sheet of hard, smooth, vulcanized rubber, and the back pressed over with a rubber squeegee, which carries off the superfluous water. As it dries, the edges will become separated from the rubber, and when peeled or pulled off, which it readily does without sticking, the surface of the negative possesses a brilliant gloss, perfectly even and uniform.

Both sides of the rubber sheet may be utilized in this way. The paper dries quite rapidly in about half an hour.

Glass may be used in place of rubber; but in order to prevent the film from adhering, it is necessary to rub over its surface a drop or two of any kind of oil, and apparently with a piece of cotton cloth, flannel, or paper polish up the glass, as if one were trying to take off every particle of oil.

Enough will remain to answer the intended purpose, and it will be found that the paper will easily strip off, by loosening or raising it at one corner.

The highest gloss will be given if fine plate glass is used. Thin paper, unless dried in this way, will invariably cockle up in creases or patches in the center, and render the obtaining of a sharp positive print somewhat difficult.

Aqua Ammonia in the Fixing Bath.—It has been found that the use of ammonia in the fixing bath for the fixing of silver prints prevents the bleaching out of the picture as much as it would otherwise do; and in the experience of many who have tried it, the following proportions have been ascertained to be the best:

Water	8 ounces.
Hyposulphite soda	1 ounce.
Aqua ammonia	1 drachm.

Chevreul the Centenarian Scientist.

On the last day of August, according to *Nature*, Professor Michel Eugene Chevreul entered upon his 100th year. Apart from the fact, that among men whose lives have been devoted to active scientific research, no one has before attained such an age, Chevreul stands conspicuous for the vast amount of work he has done, and for the great practical effect his work has had on the industries of the world. When Dumas, in 1852, addressed him on the occasion of handing to him the prize of 12,000 francs accorded to him by the Societe d'encouragement pour l'industrie nationale, he said: "Le prix consacre l'opinion de l'Europe sur des travaux servent de modele a tous les chemistes; c'est par centaines des millions qu'il faudrait nombrer les produits, qu'on doit a vos decouvertes."

More recently, in 1873, when the award of the Albert medal was made by the English Society of Arts, the terms in which the council expressed the grounds of the award were: "For his chemical researches, especially in reference to saponification, dyeing, agriculture, and natural history, which for more than half a century have exercised a wide influence on the industrial arts of the world."

His scientific work, apart from its commercial outcome, was recognized by the Royal Society of London as far back as 1826, when he was elected a foreign associate. In 1857 the Copley medal was awarded to him. Other countries have also paid him honor, while the distinctions of his native land have showered upon him. Born in Angers, in 1786, where his father was a physician of note, he was but seventeen when he went to Paris to be "manipulateur" in the laboratory of the celebrated Vauquelin. At the age of twenty he published his first chemical paper, and in the next half dozen years he had published more than a score on different subjects. Then began that series of papers (commencing in 1813), "Recherches chimiques sur plusieurs gras, et particulierement sur leurs combinasions avec les alcalis," which extended for many years.

In 1824 he was appointed Professor of Chemistry at the famed factory of Gobelins; and the energy and untiring industry which was one characteristic of his work soon accumulated stores of knowledge based on experiment. To exact experiment he attached the highest importance. He wrote, in 1823: "Experiment is not chemistry, facts alone do not constitute that science; but we cannot have discoveries without exact experiment." His "Recherches sur la teinture" is an elaborate work; and his "Moyen de definer et nommer les couleurs" occupies the whole of vol. xxxiii. of the Memoires of the Institute. It has often been remarked that it is difficult to believe that the Chevreul of "corps gras" fame and the Chevreul who wrote on colors are one and the same man.