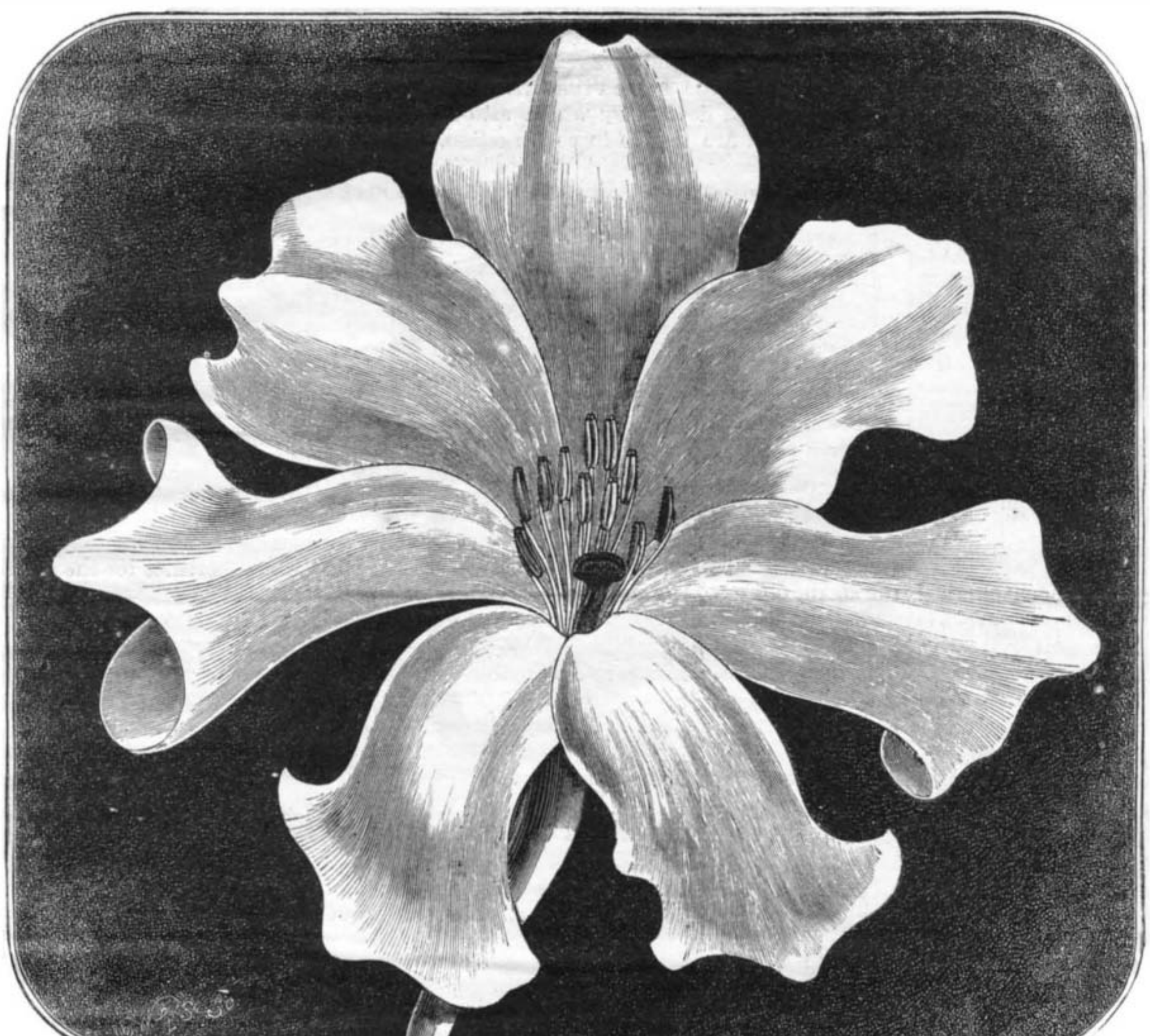
### RHODODENDRON TOVERENÆ.*

*Sp. n., F. von Muell.*

During a recent ascent of ranges fully 6,000 feet high in southeastern New Guinea, it fell to the fortunate lot of Mr. Carl Hunstein to discover a grand epiphyte, of which he brought a solitary flower, but made a colored sketch of the latter also (see Figure). Though it is unusual to define any plant botanically from a single flower, I feel no scruples in this exceptional case in placing at once this superb production of the Papuan flora on descriptive record, especially as the material, although scanty, allows of referring the plant clearly to the genus Rhododendron. Thus also I am enabled to fulfill a long-cherished wish to connect with some splendid floral treasure the name of the Marquis Goyzueta de Toverena, Consul-General in Australia for the Italian kingdom, a nobleman who has given much encouragement to my researches while worthily representing there for a series of years his great country.

Four species of Rhododendron are described from New Guinea in Dr. Beccari's *Malesia*, i., pp. 200, 202; they all came from Mount Arfak; so that the addition of a southeastern species renders it probable that these superb plants occur in numerous specific forms throughout the higher regions of the Papuan island. This fifth congener differs in its white and very large flowers from the other four; but R. Konori has also a 7 lobed corolla (a characteristic otherwise only recorded in R. Fortunei), and the number of stamens is also about the same as in R. Toverenæ, while the anthers are likewise remarkably elongated. Among the Sikkim species of Rhododendron our new one approaches to R. Edgworthi; but the flowers are numerous (forming indeed, according to the collector's note, magnificent umbel-like bunches of over a foot's width), the limb of the corolla is broader, the tube much longer, the stamens become increased in proportion to the corolla lobes, and the anthers are longer and pale colored, while (as noted by the finder of the plant) the stigma and upper part of the style are deep red; the foliage may also prove very different.



NEW RHODODENDRON FROM NEW GUINEA.—FLOWERS WHITE.

Our plant comes nearer to R. Falconeri, so far as the copious masses of its flowers, the much-lobed corolla, and the numerous stamens are concerned; but the length and width of the flowers is much greater, and the shape of the corolla is not campanulate. Indeed, only R. Griffithi in its variety Aucklandi comes up to the size of the flowers of R. Toverenæ; the latter, however, is distinguished by the comparatively slender corolla tube, much longer anthers, and a denser vestiture of the pistil. Mr. Hunstein speaks of pink leaves next the flowers, which would accord with young leaf-shoots of red tinge, such as are observed in several Rhododendrons, particularly R. Fortunei and R. Hookeri. A consideration of the fact that the calyx in many species of Rhododendron becomes obliterated strengthens the view that the floral envelope of Proteaceæ and a few orders allied to them is petaline, not calycine.—*Ferd. von Mueller, The Gardeners' Chronicle.*

### The Microphotoscope.

Mr. R. G. Mason, of Douglas, Isle of Man, is the author of the following:

The microphotoscope consists of a pair of spectacles, eyeglasses, or an eyeglass, with one or a number of minute photographs arranged in or along the rim of the spectacles, eyeglasses, or eyeglass.

The minute photographs are placed behind suitable minute magnifying glasses, and are so arranged in or along the rims of the spectacles or eyeglasses that the eyes of the wearer may see either one or all of the photographs without moving the spectacles.

The rim in or along which the minute photographs are placed may be either the rim of the spectacles themselves or a detachable rim, which may be applied to any spectacles, eyeglasses, or eyeglass.

The minute photographs may be photographs of written or printed matter, maps, charts, views, landscapes, or any object or group of objects from which a photograph may be taken.

Some of the uses to which the microphotoscope could be applied are the following:

For a student.—The series of microphotographs in the rims of the spectacles might consist of copies of an epitomized grammar, history, geography, or any subject the student wished to study. Thus, the subject he was studying would be constantly before his eyes for reference in his spare moments without the trouble of carrying books about with him.

The rims containing the microphotographs being detachable, he could at any time change the subjects.

A lecturer might have the heads of his lectures photographed and placed in the rims of his spectacles; a lawyer, his briefs; a clergyman, his sermons; a bicyclist, tricyclist, or other tourist, maps, views, and plans of the country through which he traveled; a shopkeeper, a calendar, ready-reckoner, etc.; a timber merchant or builder, cubes, measurements, and rules; travelers on the Continent, list of foreign terms, names of articles, foreign money, tables, and so on; a correspondent, an abridged dictionary of technical or difficult words; a member of Parliament, facts and figures relating to the subject of his speech; a doctor, formulæ; a public entertainer, recitations, songs, *bon-mots*, etc.; a musician, whole pieces of music; a detective, criminals wanted.

The inventor says: "It will also be evident that the microphotoscope may be applied to a variety of other uses too numerous to mention."

It will be understood that the spectacle or eyeglass frames may have in them ordinary reading-glasses when worn by those who need them, and when worn by those who do not, they may have either plain glasses or no glasses at all.

### Influence of Petroleum Cans on the Compass.

It is now claimed that refined petroleum in tin cases exerts an influence on the compasses of a vessel equal to the same amount of iron or steel. The masters of the German ship J. Weisselholm and the schooner Maggie Dalling have made written reports confirming the above, and in the latter case the captain claims that his vessel went ashore through an error caused by cased petroleum.

### The Uses of Old Bones.

A ton of ordinary bones in the principal markets today is worth about as much as a ton of American pig iron, and a ton of the best bones is worth about four times as much. For a number of manufacturing purposes, bones are valuable. The ordinary bones which are collected around through the country are burnt to get the animal charcoal or boneblack, or converted into fertilizers, and are worth about $18 per ton. There are many fertilizer manufactories in the country which grind bones, and some of them also make boneblack.

Boneblack is generally in good demand at good prices by the sugar refineries for filtering, and bones used for this purpose yield a better return than when made into fertilizers, for which accordingly only the poorer grades are used. These are the ordinary body bones of cattle and sheep, the skull being converted into fertilizing material also. The bones are rendered by being boiled in an open kettle or in closed tanks under a pressure of from 15 to 40 pounds. The tank-boiled bones are very much preferred by the boneblack manufacturers, as by this process the nitrogen is removed and the carbon left.

The leg bones of cattle and sheep are used for a number of different purposes. The shin bones and feet of cattle contain considerable neatsfoot oil; about a pint being obtained on an average from every four feet of good sized cattle. The skin and thigh bones are thoroughly cleansed of all meat and grease. The liquor in which they were boiled was formerly thrown away, but now a very fair quality of sizing glue is manufactured from it. Some shin bones are burnt for boneblack or converted into fertilizers, but the bulk of them are worked up into knife handles.

The round shin bone comes from the hind leg, and the flat from the fore leg. The bulk of the shin bones in the Eastern market are shipped to Europe, though there is a manufactory at Newburyport, Mass. The knuckles of the shin bones are sawed off, and used either for lampblack or fertilizers. Shin bones for knife handles will bring over $40 per ton, but for burning, etc., only about $25 per ton. The knuckles of thigh bones are also sawed off and used for boneblack or fertilizers. The thigh bones are worth $80 per ton, and are manufactured into tooth brush handles. Very few are exported.

The front leg bones of cattle are worth about $30 per ton, and manufactured into collar buttons, fancy bone trimmings, jewelry, parasol handles, etc., both here and in England. The American factories are in Connecticut, Long Island, and Philadelphia. Sheep's legs are also manufactured into parasol handles and various fancy articles. The bone waste and dust caused by the sawing, etc., is used as a feed for cattle and hens, and is also worked up into boneblack and fertilizers.

Boston, according to the *Commercial Bulletin* of that city, is a smaller bone market than formerly, as the gradual falling off in the slaughter of cattle in that vicinity, and the increase in the West, has caused a decrease in the amount of bones coming into that market. Occasionally cargoes of South American bones are received at that port, and are either bought by boneblack or fertilizer manufacturers or shipped to England.

### Coal in Wyoming.

In cutting the 1,400 foot tunnel of the Oregon Short Line at Twin Creek, Wyoming, seven veins of coal were pierced. These dip at an angle of about 40 degrees, and are 5, 7, 8, and 20 feet thick. On the west side of tunnel, at Mine No. 1, the road is taking coal from three veins, respectively 5, 8, and 10 feet, and is tunneling for another vein 18 feet thick. At Mine No. 2 they are extracting from a 14 foot vein. This coal burns to a white ash, is a good steaming coal, but possesses the defect of slaking badly upon exposure to the air. In mining, about one-fourth is waste, because of this disposition to slake and crumble.

A VIRGINIA walnut tree was recently sold for $600. It was so big the purchasers made money.

* *Rhododendron Toverenæ.*—Corymbs containing about twelve flowers, each on an average 6 inches long and wide; calyx reduced to a terminal narrow oblique expansion of the stalklet, the latter nearly glabrous; corolla pure white, its tube slender cylindrical, about 3 inches long, but not half an inch wide at the middle, slightly widened upward, lobes seven, horizontal, oblong-ovate, somewhat waved, scantily reflexed at the margin for short spaces, rounded-blunt or according to the sketch) occasionally sinuous at the summit or there produced into two or three lobules; stamens fourteen, somewhat exserted, about 4 inches long, filaments in their lower portion densely beset with short spreading hair, in the upper portion nearly glabrous; anthers linear-cylindrical, nearly or fully half an inch long; pistil hardly longer than the corolla tube, cover of the stigma patellar, ovary 7 celled, stigma 7 lobed, style about 1½ inches long, as well as the ovary fulvous-velvety, except toward the summit.—*F. v. M.*

### Surface Life in the Gulf Stream.

The explorations of the U. S. Fish Commission, chiefly within the last two years, have brought to light many wonderful facts connected with the Gulf Stream. The deep water dredgings of 1883, and now more strikingly of 1884, have added multitudes of new types of both vertebrates and invertebrates, illustrating those features of the deep sea fauna which have been becoming so conspicuous and characteristic in the zoological reports of the last year and more. It is not with the individual forms that we have now to deal, but merely with the fact that in those immense depths, 2,000 fathoms and beyond, the bottom of the sea swarms with animal life to a degree that appears almost incredible. The actual bed itself is alive with crustaceans, mollusks, radiates, etc., while the stratum of water so near to it as to be within the depth of a trawl's mouth is filled with fishes prowling about for food. Whether the mass of water between these strata of the bottom and those of the surface is full of living objects, we have as yet no means of knowing.

The trawls pass through all in their descent and their ascent, and part of what they eventually contain may perhaps have been captured in mid-depth, but it is not probable that this can take place to any considerable extent.

At all events, our real explorations have to do chiefly with the surface and the bottom; and the results obtained at the surface are in some respects more wonderful than those from the deep dredgings. The working of the trawls has been freely described and figured, but little has been said of the collections made within a depth of less than two feet, and yet zoologically they are rich beyond all description, and biologically they set before us a problem which is not easy of solution. The means of collecting are exceedingly simple. It is done either with hand nets or drag nets, being in either case a metallic ring to which a deep gauze bag is attached. They can be used to advantage only while the vessel is in very gentle motion; and the first impression made by the use of a drag net in the Gulf Stream for even a very short time is of simple, unbounded astonishment at the apparently limitless profusion of animal life. One is tempted to believe that the vessel is floating, not on water which contains animals, but on a sea of minute living objects with barely sufficient water to give them freedom of motion. The gauze bag speedily becomes so completely clogged with its living load that no water can pass through it until it is cleared. Drawing it in and emptying it into a bucket, perhaps a gallon of "pudding" is secured, which contains probably a greater number of distinct and independent living beings than there are human inhabitants of the earth at this moment.

This is no exaggeration. The numbers are utterly beyond computation. Of course all of these are of extreme minuteness, for the larger species easily escape the slow moving net. The smaller crustacea (oopepods, branchiopods, etc.), the swimming mollusks (pteropods mostly, though not a few cephalopods are among them), various forms of annelids, the tunicates (most especially the salpæ)—these are swept into the net, through whose interstices in the mean time the more minute objects have been escaping; but as the soft and yielding mass gradually thickens the gauze the little things which are really microscopic are detained on its surface, and serve to increase the mass, though hundreds of thousands and even millions are needed before they become fairly appreciable. The larval stage of the echinoderms is represented with an almost infinite richness, and with them come the hydroids and jelly fishes, and then the infusoria, the foraminifera, till we reach absolutely the lowest grades of animal life, including the well known globigerinæ, whose microscopic silicious shells are constantly helping to build up the soft ooze at the greatest ocean depths. These are the objects which the gauze net has collected while dragged slowly along for perhaps one to two hundred yards. And if we have gathered our hundreds of millions of individuals within such an extent, what effort of the imagination can stretch out to numbers which shall even approximately reckon up the surface life in the Gulf Stream, were we to take but even a single square mile of its extent? For it is worthy of note that this richness is not the result of concentration.

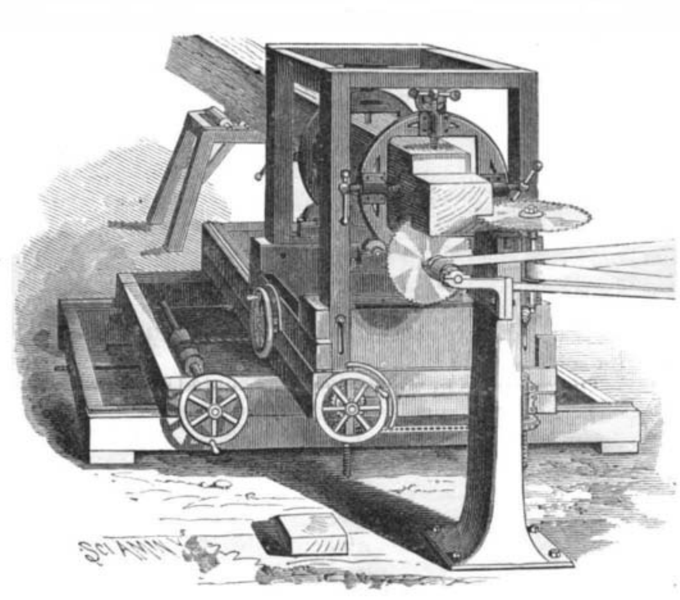
In other places (we have a notable example at Wood's Holl) there are certain occasions when, for a brief period, owing to the run of the tide, and the eddies caused thereby, we may find a state of swarming animal life as remarkable as that which we have specified, but it is only for a very restricted space; whereas in the Gulf Stream, so evenly diffused are the teeming myriads, that out of 150 sweeps of the net only one or two will fail to realize very nearly what we have stated.

Nor is it only in numbers of individuals that the lavish profusion exists; the catalogue of distinct types, reckoned as species, is certainly full of suggestiveness. Without counting the majestic and powerful animals, drawn together in their wide sea rovings by the abundant supply of food—the whales, blackfish, porpoises, etc., and with them the fierce sharks in swarms, together with the fleet and savage dolphins, albicore, bassacudas, and so on—it is safe to count the smaller fishes up to 25 at the very least. Of the crustacea in their various grades, there are certainly 50 species. The mollusca have 60 distinct specific forms, probably more. Of the annelids we find 15; of the tunicates, 8; of the polyzoa, not less than 10; of the echinoderms, 5; of the hydrozoa, certainly as many as 25; while the radiolaria, foraminifera, and other infusoria reckon up 30 as a minimum. These give us 228 species, which total will surely be enlarged by further research.

### MACHINE FOR FRAMING TIMBER.

The engraving shows a machine for cutting tenons on the ends of timbers, such as the "square set" for supporting the earth and rock around shaft, drift, and tunnel cuttings, and for use in framing timbers for other purposes. The two saws are mounted upon a fixed frame so as to rotate at right angles to each other, and so as to cut to the same line both ways through the timber. The timber carriage has a forward and backward motion, and is provided with rotatable timber clamps, by which the timber may be turned axially, in order to present all of its faces to the saws. That portion of the carriage which carries the clamps is so mounted as to rotate horizontally, thus permitting both ends of the timber to be presented to the saws. The timber clamp frame is adjustable toward and away from the saws, to govern the length of the framed timbers.

The various devices by which all of these motions are effected are simple in construction, durable, and permit of easy and rapid manipulation, and are so placed as to be within convenient reach of the operator. It will also be seen that when once placed in the machine the timber is under complete control of the operator.



BLEY'S MACHINE FOR FRAMING TIMBER.

Additional information concerning this timber framing machine can be obtained by addressing the inventor, Mr. William J. Bley, of Silver King, Arizona.

### An Electric Tram Car.

Experiments have been carried out for a few months past in a quiet and systematic way with a view of determining the value of secondary batteries, in conjunction with electro motors, for the propulsion of tram cars in crowded cities. Mr. A. Reckenzaun has designed, and the Electrical Power Storage Company has constructed, apparatus which, says the *Engineer*, promises a very handy means of locomotion on street rails, and for more than two months past a car has been running on a line put down for experimental purposes in the yard of the Storage Company at Millwall. The line—4 feet 8½ inches gauge—is 400 feet long, forming a right angle of nearly equal sides, so that about half way a curve of 35 feet radius has to be passed. From one end, as far as the commencement of the curve, the road is tolerably level; but with this curve commences an incline of 1 in 40, which rises gradually until it reaches the maximum of 1 in 17 nearly at the end of the up journey; thus it is impossible to make a rush for the hill, on account of the sharp curve intervening. The car itself is an old one procured from one of the metropolitan tramways, and it has done many years' service while drawn by horses on the Greenwich, Westminster line. The body of this vehicle weighs 2½ tons, and it accommodates forty-six passengers. The accumulators furnishing the electric energy are of a special type manufactured by the Storage Company, to the designs of Mr. Reckenzaun. Stowed under the seat on long trays, which run on rollers for their speedy removal, they are out of sight, and the whole car internally and externally has the ordinary appearance. The motor and gearing—Reckenzan's patent—are placed underneath the car, and occupy so little space that to an ordinary observer they are invisible. The speed may be varied from three miles to ten miles per hour.

Electric tram cars propelled by accumulators have been made and tried on several occasions in London, Paris, and Brussels, but hitherto with little success, and eminent men have pronounced the accumulator system of motive power as impracticable. One of the main reasons assigned was that batteries were much too heavy. The Electrical Power Storage Company has, we are told, reduced the weight without sacrificing either efficiency or durability. The accumulators in the car under notice weigh 1¼ tons, the motor, gearing, and accessories weigh about ½ ton, bringing the total weight of motive power to 1¾ tons for a car which, with its full complement of passengers, weighs itself 5½ tons; while the batteries, motor, and gearing are capable of furnishing at any desired moment a power of sixteen horses if required. Comparing this weight of 1¼ tons, with that of a steam tramway locomotive, or a compressed air locomotive, either of which will weigh some eight or ten tons to do the same amount of useful work, stored electricity has the advantage in proportion of about five to one, so long as the propelling force is directly proportional to the weight moved. It has also been said that there is a great waste of power in the use of accumulators for motive power, as the conversion of energy has to pass through several stages, viz., steam into electric current, current into oxygen and hydrogen, and these again into current and electro-motive power. It can be shown from prolonged experiments and practice that the total loss of energy with all these transformations is 66 per cent between the steam engine and the tram rails. Tramway steam locomotives consume from three to four times as much fuel per horse power as large stationary engines, such as would be used for driving dynamo machines; and bearing this in mind, an efficiency in the electrical tram car far below the one quoted above would still be considered economical. The prime cost of the electrically propelled cars with the charging station is less than steam cars, and the depreciation and repairs of machinery must also be less, on account of the few wearing parts and the complete protection from dirt.

The running cost, including 15 per cent depreciation on machinery and 50 per cent on accumulators, is given as 3·5d. per car mile, which is about one-half of the cost of horsing on tram lines. The car on the line at Millwall runs for two hours with one charge, starting, stopping, and reversing every sixty seconds, and the discharged accumulators can be replaced, it is said, almost as quickly as changing a pair of horses, by means of a trolly, which brings and removes the trays of cells, running on rollers. The whole arrangement has been very carefully worked out in every detail, the mechanical parts being as well arranged. The load is distributed upon two small bogies, so that no objection can be raised on the part of tramway companies using light rails laid for horse car traffic, and the old rolling stock can be readily utilized by putting the bogies which carry the motor under the car, and fitting the space under the seats for the reception of the accumulators. The car is brilliantly lighted by four 20 candle power Swan lamps, and bell pushes inside the vehicle enable the passengers to call the conductor and driver at the same time by the ringing of electric bells.

### Rise of the Swedish Coast.

An examination of a series of water marks set in 1750 all round the Swedish coasts, from the mouth of the Tornea to the Naze, in order to settle a dispute between the Swedish astronomer Celsius and some Germans, as to whether the level of the Baltic had been rising or sinking, shows that both parties were right. The gauges were renewed in 1851, and again this year, and have been inspected regularly at short intervals, the observations being carefully recorded. It appears, says *Nature*, that the Swedish coast has been steadily rising, while that on the southern fringe of the Baltic has been as steadily falling. The dividing line, along which no change is perceptible, passes from Sweden to the Schleswig-Holstein coast, over Bornholm and Laland. The results have lately been published by the Swedish Academy of Sciences; and it appears from them that while during this period of 134 years the northern part of Sweden has risen about 7 feet, the rate of elevation gradually declines as we go southward, being only about one foot at the Naze, and nothing at Bornholm, which remains at the same level as in the middle of the last century. The general average result would be that the Swedish coast had risen about 56 inches during the last 134 years.

THE friends of Professor Huxley will be pained to learn that his health is so impaired that he is obliged to spend the winter in southern Europe. From last advices he was staying at Naples, and is already much the better for rest and change. He will pass a month or two at the interesting old city of Amalfi, where it is hoped he will regain perfect health.