THE HEAVENS FOR NOVEMBER.

BY WILLIAM R. BROOKS, M.A., F.R.A.S.

The right ascension of the sun on November 1 is 14 h. 28 m. 40 s. and its declination south 14 deg. 41 m. 15 s.

The right ascension of the sun on November 30 is 16 h. 28 m. 24 s. and its declination south 21 deg. 47 m. 3 s.

For several days in October the sun's disk has been quite clear from spots, but although in the minimum stage of sun spot activity, it will pay to keep watch for developments of, for the time, unusual character.

MERCURY.

Mercury is morning star at the opening of the month.

On November 7, at 12 hours, however, Mercury comes into superior conjunction with the sun and changes to evening star.

On November 8, at 8 hours, Mercury is at its descending node.

On November 12, at 2 hours, Mercury is in conjunction with Mars, with Mercury 22 minutes of arc south of Mars.

On November 16, at 7 hours, Mercury will be in conjunction with Uranus, when Mercury will be 1 deg. 4 m. south of Uranus.

On November 18, at 1 hour, Mercury will be in aphelion, or in that part of its orbit most distant from the sun.

On the same date, at 7 hours, Mercury will be in conjunction with Saturn, when Mercury will be 2 deg. 54 m. south of Saturn.

A conjunction of Mercury and the moon occurs on November 24, at 8 h. 31 m., when Mercury will be 2 deg. north of the moon.

The right ascension of Mercury on the fifteenth of the month is 15 h. 42 m 11 s. and its declination south 20 deg. 29 m. 8 s.

VENUS.

Venus is morning star, and is still the most brilliant object in the eastern morning sky.

The interesting conjunction of Venus and Jupiter in October we trust was observed by many readers of these notes. The very marked brilliancy of Venus over its giant neighbor was particularly striking.

On November 6, at 11 h., Venus arrives at its greatest heliocentric latitude north.

On November 22, at 9 h. 29 m., Venus will be in conjnnction with the moon, when the planet will be 6 deg. 39 m. north of the moon.

On the first of the month Venus rises at 4 h. 23 m. and crosses the meridian at 10 h. 10 m. A. M.

On the last of the month Venus rises at 5 h. 35 m. and crosses the meridian at 10 h. 34 m. A. M.

The right ascension of Venus on the fifteenth day of the month is 14 h. 4 m. 12 s. and its declination south 10 deg. 59 m. 18 s.

MARS.

Mars is evening star until November 21, on which date, at 7 hours, it comes into conjunction with the sun and changes to morning star.

On November 21, at 4 hours, Mars is in conjunction with Uranus, when Mars will be 24 minutes of arc south of Uranus.

On November 24, at 4 h. 9 m., Mars and the moon will be in conjunction, with Mars 4 deg. 4 m. north of the moon.

On November 27, at 1 hour, Mars will be in conjunction with Saturn, when Mars will be 2 deg. 2 m. south of Saturn.

On the first of the month Mars crosses the meridian at 7 minutes past noon, and sets at 5 h. 8 m. P. M.

On the last of the month Mars rises at 6 h. 56 m. A. M. and crosses the meridian at 11 h. 38 m. A. M.

The right ascension of Mars on the fifteenth day of the month is 15 h. 31 m. 18 s. and its declination south 19 deg. 13 m. 25 s.

JUPITER.

Jupiter is morning star, and slowly coming into position for telescopic observation, although still at a rather low altitude at dawn.

On November 20, at 10 h. 52 m., Jupiter is in conjunction with the moon, with the planet 6 deg. 24 m. north of the moon.

On the first of the month Jupiter rises at 3 h. 19 m. and crosses the meridian at 9 h. 20 m. A. M. On the last of the month Jupiter rises at 1 h. 48 m. and crosses the meridian at 7 h. 44 m. A. M.

The right ascension of Jupiter on the fifteenth day of the month is 12 h. 14 m. 37 s. and its declination south 0 deg. 20 m. 0 s.

SATURN.

Saturn is evening star throughout the greater part of the month. On November 25, at 1 hour, Saturn comes into conjunction with the sun, and changes to morning star, but is too near the sun to be visible.

On the first of the month Saturn crosses the meridian at 1 h. 10 m. and sets at 6 h. 3 m. P. M. On the last of the month it rises about 20 minutes before the sun and crosses the meridian at 11 h. 27 m. A. M.

The right ascension of Saturn on the fifteenth day of the month is 16 h. 1 m. 43 s. and its declination south 18 deg. 54 m. 22 s.

URANUS AND NEPTUNE.

Uranus comes into conjunction with the sun on November 21, at 3 hours, and is therefore invisible. Neptune is approaching opposition to the sun, but does not reach it in November. It is, however, well placed for telescopic observation before midnight.

The right ascension of Neptune on the seventeenth day of the month is 5 h. 24 m. 47 s. and its declination north 21 deg. 48 m. 20 s., and changes its position very little throughout the month.

ALGOL.

Minima of the variable star Algol will occur as follows in Greenwich mean time:

	Hour.	Minute.
November 3	22	36
9	16	14
15	9	47
21	3	30
26	21	7

Only alternate minima are given above. Others may be found by using the interval 2 days 20 h. 49 m.

Smith Observatory, Geneva, N. Y., October, 1897.

Science Notes.

Moscow, in honor of the medical congress just held there, gave $1,000 for a prize to be awarded to some person who has done eminent service to medical science during this generation. On Prof. Virchow's motion, the prize was given by the congress to Henri Dunant, founder of the Red Cross Society, who is living in great poverty in Switzerland.

Dr. Maragliano's serum for pulmonary phthisis, whatever its composition may be, has been used for over a year by reputable Italian physicians with great success, according to the Lancet. Dr. De Renzi, for twenty-nine years professor of clinical medicine in the Naples University, reports forty-four cases of cure by the serum in his hospital cases, while in private practice, when the patients belong to better classes and are not so far advanced in the disease when they first come to the doctor, the results are much better. Dr. De Renzi has found no remedy for consumption superior to this serum.

The German papers record the death of Dr. Hans Hermann Julius Hager at the advanced age of eighty-nine. In early life, after leaving school, he was four years as pupil in an "apotheke" in Salzwedel, and even during that period commenced the literary work by which he afterward became famous. In recognition of the merit of his various publications he was excused his assistant examination. On passing his qualifying examination he took a business at Fraustadt, which he carried on with the assistance of a pupil for seventeen years. He then removed to Berlin and devoted himself entirely to scientific and literary pursuits, in connection with pharmacy. The number of works he produced was very considerable, and several of them were translated into various languages. His services to the art were recognized not only in Germany, but in other countries, and at the time of his death he was an honorary member of thirteen pharmaceutical societies.

To facilitate the study of X rays, A. Imbert and H. Bertin-Sans had a special kind of "photometer" constructed by MM. Ducretet and Lejeune, which consists essentially of a fluorescent screen over which is laid a coarse grating of lead wires and a prism of aluminum. When the X rays examined are feeble, they are only able to penetrate the thin end of the prism, and no shadows of lead wires are visible on the screen except under the thin end. This happens when the vacuum tube is exhausted just enough to give X rays. As exhaustion proceeds more lead wires become visible, and when the tube is on the point of becoming non-conducting the illumination over the whole of the screen is uniform, and the shadows stand out with equal sharpness. At this stage, indeed, aluminum becomes perfectly transparent to the rays, and so do the bones of the hand. This type of rays is particularly well suited for the radiography of the deeper seated anatomy.—Comptes Rendus.

The atomic weight of magnesium has recently been redetermined with great care by Prof. Richards and Mr. Parker, of Harvard, and an account of their results appears in the current numbers of the Proceedings of the American Academy of Sciences. The previous determinations of the atomic weight of this element showed a remarkable inconsistency until the year 1884, when Marignac recorded the results of a large number of closely concordant experiments pointing to the number 24·37. The accuracy of this number has now been confirmed by Messrs. Richards and Parker. The method selected, says Nature, was the analysis of magnesium chloride. The salt was prepared, with great precautions, from the double magnesium and ammonium chloride by heating in a current of dry hydrogen chloride; it was then transferred to a weighing tube, without the possibility of contact with moisture, and the chlorine precipitated by silver nitrate, either gravimetrically or volumetrically. The results of four series of very concordant experiments give the number 24·362 as the atomic weight of magnesium when oxygen is taken as 16·00 or 24·179 if oxygen be taken as 15·88.

A SCOTTISH BUILT FERRY BOAT FOR NOVA SCOTIA.

BY A. J. SINCLAIR.

On Sunday morning, August 15, the new ferry boat Chebucto left Gourock Bay, Scotland, for Halifax. The vessel returned to Gourock Bay on the forenoon of August 23, having put back from sea owing to the stress of weather. She had proceeded three hundred miles on her journey when the captain deemed it advisable to put back, as the crew did not wish to go any further with the vessel, and, owing to the bad weather and a prevailing adverse wind, he was justified in returning to the Clyde.

The Dartmouth Ferry Commissioners, of Halifax, Nova Scotia, sent out offers toward the end of last year for the construction of a ferry steamer, and it was after keen competition with United States, Canadian, and other shipbuilders that Messrs. John Shearer & Son, Kelvinhaugh Slip Dock, Glasgow, secured the contract to build the vessel. The Chebucto is a vessel of about 600 tons gross and is of a novel type. Both ends are alike, and at each end there is a screw propeller and rudder. The underwater body and ends of the vessel are yacht like in fineness. She was built for special goods and passenger ferry traffic between Dartmouth and Halifax, Nova Scotia.

She is of the following dimensions: Over-all length, 140 feet; between perpendiculars, 125 feet; breadth extreme, 50 feet; breadth moulded, 33 feet; with a moulded depth of 13 feet 7 inches. The main body is constructed of steel to Lloyds highest class, with heavy deck beams, supported by longitudinal truss channel girders, each side of the vessel, for cart and carriage traffic. These beams are carried out in one length to extreme width of vessel, forming the sponson deck. The wings are part of the integral structure, being supported by the outward sweep of the ship's frame and shell plating. On these wings are two spacious houses, each about 100 feet long by 10½ feet wide by 13 feet high, seated all round with handsome curve back settee chairs, divided by electroplated elbows, affording seating accommodation for 222 passengers.

The woodwork of the house is a combination of cherry wood and yellow pine. There are two tiers of windows in the sides, the upper tier being filled in with cathedral glass.

The ornament is very chaste, a fine effect being produced by the introduction of a light band of linerusta of elegant floral festoon design.

In the center of the vessel a monitor's house is built the whole length of the machinery space, for light and air to the engine room and access to the hurricane deck, the continuation of which to sides forms roofs of side houses. On the hurricane deck two pilot houses (one at each end) are placed, containing steering gear for each end of the ship. Extending over the hurricane deck and embracing pilot houses a light awning deck is fitted, shading a very commodious arrangement of deck seats of elegant construction. A complete installation of electric lighting has been fitted throughout, the pendent electroliers being very handsome. The cabins are heated by a thorough system of steam radiators. The Chebucto is rather a novel vessel, being of the three-decked American type, and there has been nothing built in Britain like her before. In the machinery department the vessel is quite as novel. The engines were supplied by Messrs. McKie & Baxter, Copeland Works, Govan, Glasgow, and consist of two pairs of double compound surface condensing engines, the sizes of the cylinders being 12 and 24 inches in diameter, with a piston stroke of 18 inches.

Steam is supplied at a working pressure of 125 pounds by two Admiralty type boilers (each 7 feet 6 inches in diameter by 18 feet long), each having two of Fox's corrugated furnaces. The boilers were supplied by Messrs. A. Nicholson & Company, Glasgow. There is an installation comprising five pumps, by the Blake & Knowles Steam Pump Works (Limited), including a duplex independent air pump, the first of its kind which has been fitted to a vessel in Britain, a special form of feed pump, a donkey pump, a boiler circulating pump and a sanitary pump. Hancock's inspirators are fitted for feeding the boilers and Hancock ejectors for cleaning the bilges. The air pump discharges into a tank from which the feed draws through a filter, the speed of this pump being automatically controlled by a float. The exhaust steam for all the auxiliary engines is carried to the condenser, and the feed water passes through a heater on its way to the boilers.

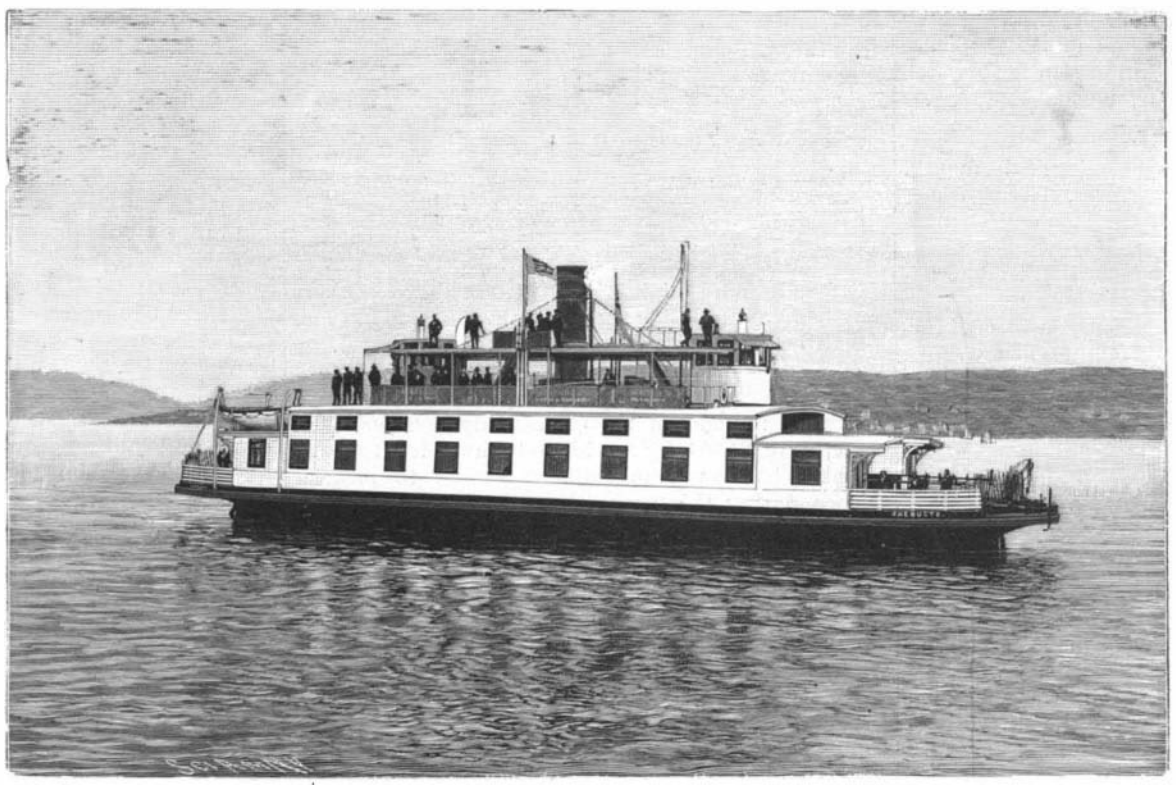
The centrifugal circulating pump was made by Messrs. McKie & Baxter, is one of their "Challenge" patterns, and has a special balanced valve, the invention of Mr. Baxter. The engines are reversed by direct acting steam gear upon an entirely new principle, the invention of Mr. Baxter and Mr. D. B. Donald, of Falmouth, and for which provisional protection has been secured. The boilers supply steam to an electric light engine and to the heating appliances throughout the vessel. In all there are thirteen separate engines in the engine room.

The Chebucto was launched at Glasgow on the 30th of June, and it was not until the 12th of August*

*The illustration sent showsher on the trial trip day.

that she ran her official speed trial on the Firth of Clyde. On the invitation of Bailie John Shearer (senior partner of the firm that built the vessel) about fifty gentlemen accompanied the ferry steamer on her trial trip. She did two runs on the measured mile at Skelmorlie with both screws working, and with the engines going 170 revolutions per minute and indicating 400 horse power, she gave a mean speed of close upon 10 knots, which is equal to 11½ miles an hour, which, for a vessel of her class, is a thoroughly worthy performance.

After the trial, the Chebucto proceeded up the river to Glasgow the same evening, where she took on board 200 tons of bunker coal and was made ready for the passage across the Atlantic, her fore and after ends being boarded in and all her windows covered over with planking.



A SCOTTISH BUILT FERRY BOAT FOR NOVA SCOTIA.

A GREAT PELICAN ROOKERY.

BY C. F. HOLDER.

It has always been somewhat of a mystery where the numerous brown pelicans, so common on the Southern Californian coast, make their headquarters. During the summer months these lumbering birds, which bear so grotesque a resemblance to some of the old pictures of the dodo, come into the little bays alongshore and engage in a vigorous warfare upon the small fry—anchovies, herring, smelt and young mackerel—which are found there in such vast quantities.

The pelicans are very tame and pursue their avocation within a few yards of vessels lying in the bays. Their method of obtaining food is arduous in the extreme, and it is only by continual vigilance that they make a living. In hunting for food they fly heavily, twenty or thirty feet above the water, the long and singular bill, from which depends a capacious pouch, pointing downward, the small brown eyes on the watch for the expectant school of fish. Should it appear, the bird apparently throws itself over, then plunges downward, head first, with mandibles apart. The height of the dive carries the bird in many instances completely out of sight beneath the water, from which it rises in a few seconds, and if it has been so fortunate as to engulf a sardine or several in its capacious mouth, it tosses them up, seemingly from the pouch, by throwing the bill aloft, then swallows the morsels with self-congratulatory wagging of the diminutive tail, suggestive of its satisfaction.

The capture of game is not always a guarantee of a feast. The laughing gull, common in these waters, preys upon the pelican or robs it systematically whenever it can. This it accomplishes by alighting on the pelican's head or back as it rises, and as the clumsy bird attempts to arrange the morsel in its mouth preparatory to swallowing, the gull reaches forward and snatches it from between the long mandibles and flies away with exultant cries.

It has been supposed by many that the brown pelicans make their headquarters in Lower California, coming north in the spring; but during the past season the writer, during a cruise among the islands off Santa Barbara County, found the rookery of these birds. The islands which constitute the group are divided into two series—the Santa Catalina, off Los Angeles County, lying, according to the chart, in what is called the Santa Catalina Channel. These islands include San Clemente, Santa Catalina, San Nicolas and Santa Barbara. Seventy-five miles to the north lies the second division, comprising Santa Cruz, Santa Rosa, San Miguel and Anacapa. The latter is a long, slender, rocky island, rising from the water's edge to a mesa between one and two hundred feet in height at the east end. The highest portion recalled the famous enchanted mesa, as it was evidently inaccessible except by using ropes and a kite.

The island is divided into three distinct portions by the sea. The extreme end is flat, terminating in a pinnacle of rock, while through the center is a lofty arch, high and broad enough to admit the passage of a large yacht, through which the sea runs. The mesa was covered with birds, and as we ran near and fired the yacht's cannon there arose a cloud so vast that it fairly colored the air. Every bird had a long bill, and it suddenly dawned upon us that here was the home of the brown pelican on the Southern California coast. The great ledge of rock, flat on top, was colored white by the guano of the birds, and was distinguishable five or six miles distant. As we approached, the side of the cliff, which formed a slight angle, was seen to be covered with pelicans. They scrambled up the rocks from the lower portions, waddling with bills partly open and wings expanded. As the sound of the gun reached them the very ground seemed to rise, the birds whirling slowly upward in great circles, then slowly settling again.

The rookery, isolated and inaccessible, occupied probably four or five acres, where the birds seemed to be packed in; and that it was an ancient one there was every reason to believe. Here, in all probability, the young are reared in May. At the time of our visit, the middle of August, the rookery appeared to be occupied by old birds and two-thirds grown young.

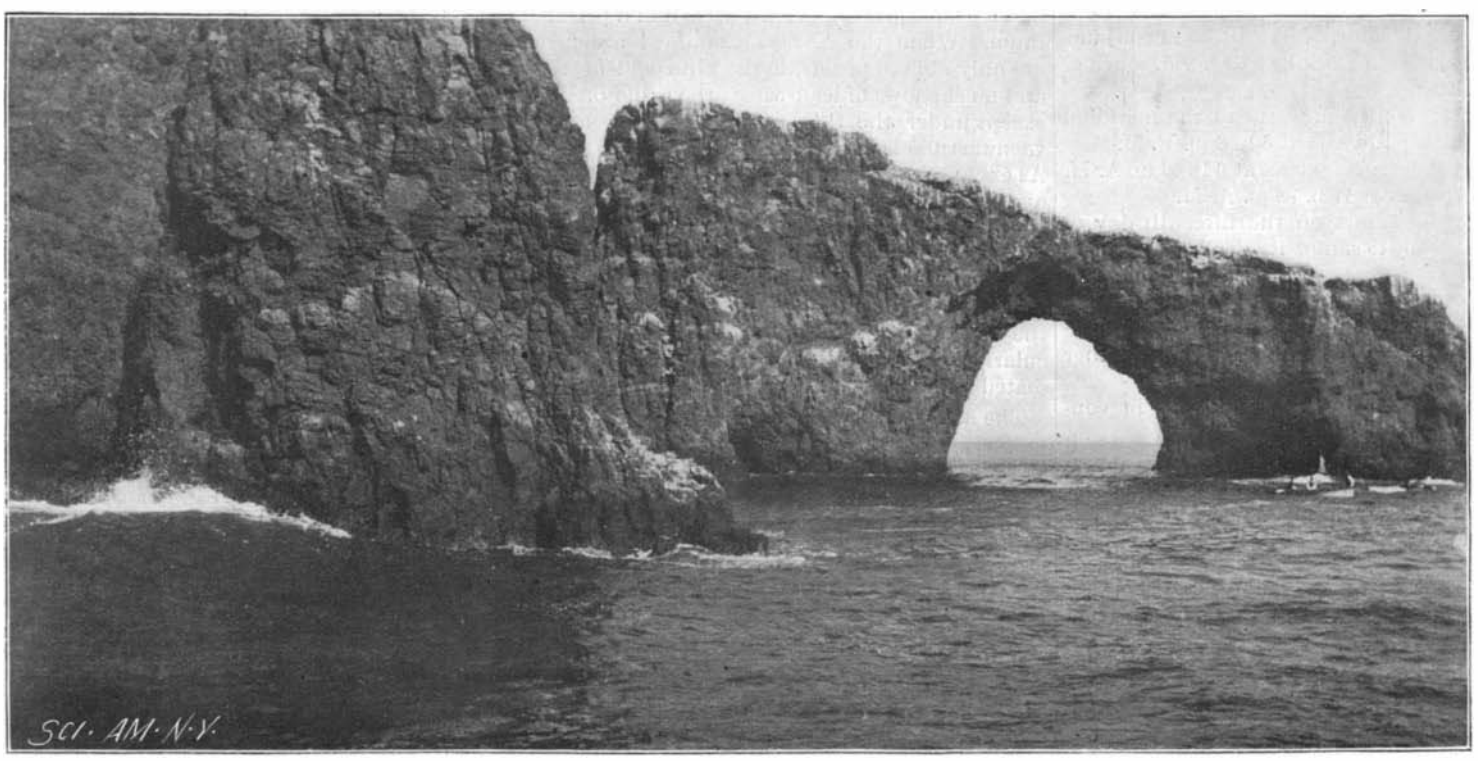
The pelicans here nest on the ground, there being no trees of any kind on this wind-swept island. This is in direct contrast to the brown pelican of the Florida keys, at least in instances observed by the writer, where the nests were in mangrove trees which were growing almost in the water. The nests were of the crudest description, the eggs retaining their position by virtue of good luck.

Not ten miles from the pelican rookery of Anacapa was seen a series of remarkable caves, in the entrance of one of which was a shag rookery. This was discovered by the aid of the odor some distance off. Upon approaching, a remarkable overhanging cliff was seen, the summit of which was possibly 500 feet above the water—a stupendous pile of rock. Near the base it had been eaten away by the sea, leaving a series of rough shelves or ledges which were occupied by shags, old and young.

Leading directly into the cliff was a large cave, whose side entrance was also pre-empted by shags, who were, in the main, two-thirds grown.

After some difficulty, the writer landed and climbed into this rookery. The nests were of kelp and other sea weed roughly thrown together, and strewn about on the rocks were numbers of young birds, some nearly devoured and others partly torn in pieces, showing that some animal preyed upon them. After a careful examination of the surroundings, the writer was forced to think that, half starved, the birds had preyed upon each other and that it was a case of a literal survival of the fittest. On the water in the cave floated numbers of dead young shags which had evidently fallen in, and unable to swim, had been drowned. Yet the young handled were strong and powerful and used their sharp beaks to good advantage.

In the same cave an attractive swallow with white markings was nesting, its nest being fastened to the walls. They were made almost entirely of the feathers of sea birds, covered on the outside with a light clay veneer which made them very heavy and also almost indistinguishable from the rock, this probably being the object of the birds—an interesting instance of protective



A GREAT PELICAN ROOKERY.