

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S. or Canada, \$3 00
One copy, six months, for the U. S. or Canada, 1 50
One copy, one year, to any foreign country belonging to Postal Union, 4 00

Australia and New Zealand.—Those who desire to receive the SCIENTIFIC AMERICAN, for a little over one year, may remit \$1 in current Colonial bank notes. Address MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

The Scientific American Supplement

Is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year, for U. S. and Canada. \$6.00 a year for foreign countries belonging to the Postal Union. Single copies, 10 cents. Sold by all newsdealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to any address in U. S. or Canada, on receipt of seven dollars. The safest way to remit is by draft, postal order, express money order, or registered letter.

Australia and New Zealand.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for a little over one year on receipt of \$2 current Colonial bank notes. Address MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

NEW YORK, SATURDAY, JULY 28, 1888.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Absinthe, Arid region, Billoon, vacuum, Congressional, Biliary secretions, action of medicines on, Books and publications, new, Buckhorn in toothache, Business and personal, Car coupling, improved, Chinese cash, Clubs, the swinging of, Cobras de capello, Diet of different people, Easel with adjustable shelf, Electric lighting, the commercial aspect of, End gate for wagons, improved, Filaria, removal of, from a horse's eye, Globe, a great, Harmonica holder, improved, High speed in thick weather, Home, summer, care in selecting, Inventions, agricultural, Inventions, engineering, Inventions, index of, Inventions, miscellaneous, Lighting in France, public development of, Lightning, curious doings of, Marine toboggan slide, Mercury, distillation of, at ordinary temperatures, Meteor, a remarkable, Metric system, the, Microscopy, Mosquito irritating pastilles, Noxious gases in houses, to avoid, Observatory, naval, at Washington, Oil, machine and watch, how secured, Photographic notes, Physics, experiments in simple, Planets, position of, in August, Poisoning by a cobra, narrow escape, Propeller blades, copper coated, Radio-microphone, Railway switch stand and signal, improved, Rifle, magazine, fire discipline, Roads, country, improving, Rock drilling machine, improved, Russian home industries, increase of, Ships, Spanish and Italian, built by the English, Show case, improved, Slipping, Small city on a block, Spirit level, improved, Stove, car, improved, Sugar machinery, Toboggan slide, marine, Trees, Central Park, Viper, spectacted, Watches, rock crystal, Water at and before meals, use of

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 656.

For the Week Ending July 28, 1888.

Price 10 cents. For sale by all newsdealers.

Table listing contents of the supplement by page number: I. ASTRONOMY.—Stellar Photography.—By EDWARD S. HOLDEN, Director of the Lick Observatory.—Treating of stellar maps, history of astronomical photography, the International Congress, photography at the Lick Observatory, etc. 10485
II. BIOGRAPHY.—Sir John Pender, K.C.M.G.—His connection with oceanic telegraphy.—Portrait. 10476
III. CHEMISTRY.—A Simple Form of Apparatus for Generating Gases.—By G. STILLINGFLEET JOHNSON.—1 illustration. 10485
Determination of Total Solids and Fat in Milk and Butter by Means of Woody Fiber.—By F. GANTNER. 10485
IV. CIVIL ENGINEERING.—The Panama Ship Canal.—Colon.—The workmen and their habits.—Advantages to commerce of the world.—3 illustrations. 10471
Timber and Some of its Diseases.—By H. MARSHALL WARD.—Part VII. of a long and valuable article.—Several illustrations. 10473
V. ELECTRICITY AND TELEGRAPHY.—The Minimum Point of Change of Potential of a Voltaic Couple.—By Dr. G. GORE, F.R.S.—Effect of Chlorine on the Electro-motive Force of a Voltaic Couple.—By G. GORE. 10476
Electrical Barometer.—Johnson Stephen's apparatus.—1 illustration. 10476
Combined Morse Ink Writer and Sounder.—3 illustrations. 10477
VI. GEOGRAPHY AND EXPLORATION.—Six Weeks in Southern Mindanao.—By J. B. STEELE.—Treating of the methods of obtaining birds, etc. 10484
The River Doce, Brazil.—Its source, banks, inhabitants of the country, etc. 10484
VII. MECHANICAL ENGINEERING.—History of the Hardie Compressed Air Locomotive.—Workings of a paper stock company.—Suggested improvements in the Mekarski car. 10472
A New Fluvial Motor.—With description and illustration. 10473
VIII. MINING.—Mica Mining in North Carolina.—By WM. B. PHILLIPS.—Conclusion of this interesting article, describing the process of dressing "black" mica, and giving some statistics. 10474
Notes on the Rock Salt Mines of Petite Anse, Louisiana.—By H. CARRINGTON BOLTON.—Abstract of an interesting paper read before the New York Academy of Sciences. 10475
IX. MISCELLANEOUS.—Dr. Vettin's Wind Vane. 10482
Cremation from a Sanitary and Sentimental Point.—The soil of cemeteries.—What cremation is. 10482
Hundredth Anniversary of the Linnean Society, London.—Account of the meeting held May 24, at Burlington House. 10485
X. PHYSICS.—Intensities of Light.—Dr. Koenig's experiments with the spectrum. 10477
Standards of Light.—Abstract from paper by Mr. W. J. DIBDIN. 10477
XI. SURGERY AND MEDICINE.—Electric Acupuncture.—Acupuncture as practiced by the Chinese.—The needles used.—Introduction into Europe.—Use of electricity.—6 illustrations. 10483
Transplantation of Nerve from the Rabbit to Man.—A detailed description of Dr. Gersung's novel operation. 10483
XII. TECHNOLOGY.—Photo-Zincograph Engravings.—Process and apparatus used by Mr. JOHN SWAIN.—4 illustrations. 10478
The Manufacture of Hydrogen.—Primitive methods of generating the gas for use in balloons.—Modern plants.—3 illustrations. 10479
The Manufacture of Glass.—The art known to the ancients.—Description of a modern glass factory, and operations performed therein. 10480

HIGH SPEED IN THICK WEATHER.

The steamer Fulda, of the North German Lloyd line, which arrived early last week, was reported by some of her passengers to have cut down a fishing schooner while crossing the Grand Banks in a fog. They said they saw the boat sinking, heard the despairing cries of her crew, and condemned in unmeasured terms the heartlessness of running so fast in a region where so many fishermen are known to congregate. The report of the Fulda's master says that the ship was running only at half speed, that she did not sink the fisherman, but admits carrying away the bowsprit and foremast. Whether or no the Fulda sunk the fisherman, the fact remains that most of the fast steamers, there is reason to believe all of them, of whatever line, are wont to run at reckless speed in thick weather. The testimony of innumerable witnesses vouches for it; the records of the ships themselves confirm it. Indeed, the masters of the best of them have, in a recent publication, fairly admitted over their own signatures that this is the practice, seeking to condone it on the ground of safety to their own ships.

In the present instance, what facts have come to light show that the Fulda was going at such a rate of speed that she could not avoid striking the fisherman. This being the case, it does not matter whether she was running at half or full speed—she was going too fast. The rules of the road at sea do not say, as one might gather from the master's report, that a steamer may run at half speed in a fog regardless of consequences. They distinctly require a steamer to slow up when in the presence of other craft, or where they are likely to be found; indeed, to stop her engines frequently, lie by, and sounding her whistle wait for a response. Clearly, if the master of the Fulda had done this, there was strong chance he would have heard the foghorn of the ill-fated fisherman in time to avoid a meeting, for every one of these keep their fog horns going while lying in the fog.

Over two thousand fishing schooners frequent these banks; they come from our own coast, Nova Scotia, Prince Edward Island, Cape Breton, New Brunswick, Newfoundland, and three little French islands on the southwestern coast of Newfoundland—Miquelon, St. Pierre, and Isle aux Chiens. The boat struck by the Fulda was evidently from one of these latter. Indeed, a dispatch says that the Jeune Edouard was cut down by a steamer on the 14th. Portions of this great fleet are always anchored or hove to directly in the path of the transatlantic steamers, and not a season passes that more or less of them are not cut down by the merciless prows of these ocean greyhounds. Rarely it is that anything is ever heard of these catastrophes—for it is at night when they are most frequent; and they will tell you in the fishing towns that a big iron steamer can cut down a fisherman without awak'ning its passengers. The howling winds and turmoil of waters drown the cries of the men struggling in the water, and the bereaved ones on the Gloucester hills or the Canadian cliffs watch long and vainly for those who will never return.

POSITION OF THE PLANETS IN AUGUST.

JUPITER

is evening star. He is in quadrature with the sun on the 20th at 3 h. A. M., being at that time 90° east of the sun and most favorably situated for observation. Jupiter in quadrature is on the meridian at sunset, and looks superbly in his elevated position as he travels on his westward path, the largest and most brilliant star among the myriads that stud the sky. He is approaching Beta Scorpii in his eastward progress, as any observer may see who marks his path among the bright stars of Scorpio. Jupiter sets on the 1st at 11 h. 40 m. P. M. On the 31st, he sets at 9 h. 48 m. P. M. His diameter on the 1st is 37'.8, and he is in the constellation Libra.

SATURN

is morning star with the exception of a few hours of the 1st, when he still ranks among the evening stars. He is in conjunction with the sun on the 1st at 8 h. P. M., when he rises and sets with the sun, passing to his western side and becoming morning star. He is invisible during the larger part of the month on account of his nearness to the sun. On the 31st, however, he rises two hours before the sun, and sharp-sighted observers may find him 9° north of the sunrise point. Saturn sets on the 1st at 7 h. 14 m. P. M. On the 31st, he rises at 3 h. 13 m. A. M. His diameter on the 1st is 15'.4, and he is in the constellation Cancer.

NEPTUNE

is morning star. He is in quadrature with the sun on the 24th, at 10 h. P. M., being 90° west of him, and rising about midnight. Neptune rises on the 1st at 1 h. 59 m. A. M. On the 31st, he rises at 0 h. 4 m. A. M. His diameter on the 1st is 2'.6, and he is in the constellation Taurus.

MERCURY

is morning star until the 23d, and then evening star. He is in superior conjunction with the sun on the 23d, at 8 h. P. M. He is in conjunction with Saturn on the 13th, at 11 h. P. M., being 39° north. Mercury rises on

the 1st at 3 h. 24 m. A. M. On the 31st, he sets at 6 h. 50 m. P. M. His diameter on the 1st is 6'.8, and he is in the constellation Cancer.

MARS

is evening star. The ruddy planet glows with decreasing luster, as easily visible in the southwest. In the early evening, he recedes from Spica and approaches Jupiter. Mars sets on the 1st at 10 h. 30 m. P. M. On the 31st, he sets at 9 h. 21 m. P. M. The diameter of Mars on the 1st is 9'.0, and he is in the constellation Virgo.

URANUS

is evening star. He sets on the 1st at 9 h. 47 m. P. M. On the 31st, he sets at 7 h. 52 m. P. M. His diameter on the 1st is 3'.5, and he is in the constellation Virgo.

VENUS

is evening star. She is still close to the sun, setting on the 31st only half an hour later than the sun. Venus sets on the 1st at 7 h. 33 m. P. M. On the 31st, she sets at 7 h. 4 m. P. M. Her diameter on the 1st is 10'.0, and she is in the constellation Cancer.

Mercury, Venus, Uranus, Mars, and Jupiter are evening stars at the close of the month. Saturn and Neptune are morning stars.

Care in Selecting the Summer Home.

The importance of examining closely the plumbing, the cellar, the kitchen, and the water supply cannot be overestimated. A reporter on the Mail and Express heard a prominent physician a few days ago deprecating in strong terms the little care which is too often exercised by people in their choice of a summer resort, and, in the course of his conversation, said:

"It seems to me that parents exercise little judgment either for their own good or for that of their children in this matter. In too many instances their selection is so bad that it would be much better for all concerned if they had remained in their city houses. The number of deaths which occur among families during their absence from home in the summer, especially among children, is positively appalling when taken in the aggregate, and in the majority of cases these deaths are due solely to the unhealthfulness of the places which have been chosen.

"It would be advisable, if possible, for one of the members of the family to make a personal examination of the surroundings of the house or locality proposed for a resting place before the time for departure arrives, and this can be readily accomplished when its distance from the city is not great, as in the towns within a radius of forty or fifty miles.

"One of the worst features of the ordinary country hotel or boarding house is its plumbing, for generally there is none at all or next to none, and where the plumbing is bad, there disease is sure to come sooner or later.

"Especial attention should be directed to the water supply, and a careful scrutiny of its source should be made. If it comes from a spring near the house, the presumption is that the water will be clear and pure, but if, on the contrary, it is discovered that it comes from a running stream, it would be advantageous to investigate the course of the stream, to see that the water is not likely to suffer from any impurities upon its banks. The location of the well and cesspools should also be learned, for if these are not separated from each other by a distance of seventy or eighty yards, it is possible for the former to be contaminated by the latter, especially when the soil is light and porous.

"Watch closely for signs of filthiness in the neighborhood of the house, for if the refuse from the kitchen is carelessly thrown upon the ground to bake and boil in the sun, it is almost certain that disease will be the result.

"In the selection of a summer home, choose one that is not completely enveloped in shade, for it will surely prove to be damp and unhealthy. Do not take a room on the ground floor, if it is possible to avoid it, unless it is certain that the cellar underneath is perfectly dry, and do not stay longer in dark rooms than is necessary."

Apropos to the above, the Iowa State Board of Health, in its monthly bulletin for June, has the following:

"Said a father who was returning from a summer resort, where he buried four lovely children, who died of diphtheria, the result of defective drainage and polluted water: 'That hotel keeper is as guilty of murder of my children as if he had shot them with a revolver.' As a matter of justice, the father was right, but in law, probably not. But, adds the health board, the law ought to be such as to hold the keeper of a hotel or public resort responsible for the healthy condition of his premises, and liable for neglect to provide pure air and water for his guests. Patrons of these places should take with them an ounce vial of saturated solution of permanganate of potash, and test the water by putting half a dozen drops of the potash in a tumbler of it. If the water turns dark or brown in an hour, and they find cesspools within one hundred feet of the house and near the wells or water supply, they should take the first train for some other place."

LONDON omnibuses are to be illuminated with electricity, the battery to be under the seat of the driver.