P

Pacific Equatorial Countercurrent. A Pacific Ocean current that flows eastward, counter to and between the westward flowing Pacific North and South Equatorial Currents, between latitudes 3°N and 10°N. East of the Philippines it is joined by the southern part of the Pacific North Equatorial Current.

Pacific North Equatorial Current. A North Pacific Ocean current that flows westward between latitudes 10°N and 20°N. East of the Philippines, it divides, part turning south to join the Pacific Equatorial Counter current and part turning north to flow along the coast of Japan as the KUROSHIO.

Pacific South Equatorial Current. A Pacific Ocean current that flows westward between latitudes 3°N and 10°S. In mid ocean, much of it turns south to form a large whirl. The portion that continues across the ocean divides as it approaches Australia, part flowing north toward New Guinea and part turning south along the east coast of Australia as the EAST AUSTRALIA CURRENT.

Pacific standard time. See STANDARD TIME.

pack ice. The term used in a wide sense to include any area of sea ice, other than fast ice, no matter what form it takes or how it is disposed.

pagoda, *n.* As a landmark, a tower having a number of stories and a characteristic architecture, used as a place of worship or as a memorial, primarily in Japan, China, and India.

paint, *n.* The bright area on the phosphorescent plan position indicator screen resulting from the brightening of the sweep by the echoes.

paint, *v., t & i*. To brighten the phosphorescent plan position indicator screen through the effects of the echoes on the sweep.

painted mark. A navigation mark formed simply by painting a cliff, wall, rock, etc.

pancake ice. Predominantly circular pieces of ice from 30 centimeters to 3 meters in diameter, and up to about 10 centimeters in thickness with raised rims due to pieces striking against one another. It may be formed on a slight swell from grease ice, shuga, or slush or as a result of the breaking of ice rind, nilas, or under severe conditions of swell or waves, of gray ice. It also sometimes forms at some depth, at an interface between water bodies of different physical characteristics, from where it floats to the surface; its appearance may rapidly cover wide areas of water.

pantograph, *n.* An instrument for copying maps, drawings, or other graphics at a predetermined scale.

papagayo, *n.* A violet northeasterly fall wind on the Pacific coast of Nicaragua and Guatemala. It consists of the cold air mass of a *norte* which has overridden the mountains of Central America. See also TEHUANTEPECER.

parabola, *n.* An open curve all points of which are equidistant from a fixed point, called the FOCUS, and a straight line. The limiting case occurs when the point is on the line, in which case the parabola becomes a straight line.

parabolic reflector. A reflecting surface having the cross section along the axis in the shape of a parabola. Parallel rays striking the reflector are brought to a focus at a point, or if the source of the rays is placed at the focus, the reflected rays are parallel. See also CORNER REFLECTION RADAR REFLECTOR, SCANNER.

parabolic velocity. See ESCAPE VELOCITY.

parallactic angle. That angle at the navigational triangle at the celestial body; the angle between a body's hour circle and its vertical circle. Also called POSITION ANGLE.

parallax, *n.* The difference in apparent direction or position of an object when viewed from different points. For bodies of the solar system, parallax is the difference in the direction of the body due to the displacement of the observer from the center of the earth, and is called geocentric parallax, varying with the body's altitude and distance from the earth. The geocentric parallel when a body is in the horizon is called horizontal parallax, as contrasted with the parallax at any altitude, called parallax in altitude. Parallax of the moon is called lunar parallax. In marine navigation it is customary to apply a parallax correction to sextant altitudes of the sun, moon, Venus, and Mars. For stars, parallax is the angle at the star subtended by the semimajor axis of the earth's orbit and is called heliocentric or stellar parallax, which is too small to be significant as a sextant error.

parallax correction. A correction due to parallax, particularly that sextant altitude correction due to the difference between the apparent direction from a point on the surface of the earth to celestial body and the apparent direction from the center of the earth to the same body.

parallax in altitude. Geocentric parallax of a body at any altitude. The expression is used to distinguish the parallax at the given altitude from the horizontal parallax when the body is in the horizon. See also PARALLAX.

parallax inequality. The variation in the range of tide or in the speed of a tidal current due to changes in the distance of the moon from the earth. The range of tide and speed of the current tend alternately to increase and decrease as the moon approaches its perigee and apogee, respectively, the complete cycle being the anomalistic month. There is a similar but relatively unimportant inequality due to the sun; this cycle is the anomalistic year. The parallax has little direct effect upon the lunitidal intervals but tends to modify the phase effect. When the moon is in perigee, the priming and lagging of the tide due to the phase is diminished and when in apogee the priming and lagging is increased.

parallax reduction. Processing of observed high and low waters to obtain quantities depending upon changes in the distance of the moon, such as perigean and apogean ranges.

parallel, *adj*. Everywhere equidistant, as of lines or surfaces.

parallel, *n*. See PARALLEL OF LATITUDE, definition 1.

parallel indexing. The use of rotating parallel lines overlayed on a radar display to aid in piloting.

parallel motion protractor. An instrument consisting of a protractor and one or more arms attached to a parallel motion device, so that the movement of the arms is everywhere parallel. The protractor can be rotated and set at any position so that it can be oriented to a chart. Also called DRAFTING MACHINE.

parallel of altitude. A circle of the celestial sphere parallel to the horizon, connecting all points of equal altitude. Also called ALTITUDE CIRCLE, ALMUCANTAR. See also CIRCLE OF EQUAL ALTITUDE.

parallel of declination. A circle of the celestial sphere parallel to the celestial equator. Also called CELESTIAL PARALLEL, CIRCLE OF EQUAL DECLINATION. See also DIURNAL CIRCLE.

parallel of latitude. 1. A circle (or approximation of a circle) on the surface of the earth, parallel to the equator, and connecting points of equal latitude. Also called a PARALLEL. 2. A circle of the celestial sphere, parallel to the ecliptic, and connecting points of equal celestial latitude. Also called CIRCLE OF LONGITUDE.

parallelogram, *n.* A four-sided figure with both pairs of opposite sides parallel. A right-angled parallelogram is a rectangle; a rectangle with sides of equal length is a square. A parallelogram with oblique angles is a rhomboid; a rhomboid with sides of equal length is a rhombus.

parallel rulers. An instrument for transferring a line parallel to itself. In its most common form it consists of two parallel bars or rulers connected in such manner that when one is held in place, the other may be moved, remaining parallel to its original position.

parallel sailing. A method of converting departure into difference of longitude, or vice versa, when the true course is 090° or 270°.

parallel sphere. The celestial sphere as it appears to an observer at the pole, where celestial bodies appear to move parallel to the horizon.

parameter, *n.* 1. A quantity which remains constant within the limits of a given case or situation. 2. One of the components into which a craft's magnetic field is assumed to be resolved for the purpose of compass adjustment. The field caused by permanent magnetism is resolved into orthogonal components or parameters: Parameter P, Parameter Q, and Parameter R. The field caused by induced magnetism is resolved into that magnetism induced in 9 imaginary soft iron bars or rods. With respect to the axis of a craft, these parameters lie in a fore-and-aft direction, an athwart ships direction, and in a vertical direction. See also ROD, definition 2.

paranthelion, *n.* A phenomenon similar to a PARHELION but occurring generally at a distance of 120° (occasionally 90° or 140°) from the sun.

paraselene *(pl. paraselenae), n.* A form of halo consisting of an image of the moon at the same altitude as the moon and some distance from it, usually about 22°, but occasionally about 46°. Similar phenomena may occur about 90°, 120°, 140°, or 180° from the moon. A similar phenomenon in relation to the sun is called a PARHELION, SUN DOG, or MOCK SUN. Also called MOCK MOON.

paraselenic circle. A halo consisting of a faint white circle through the moon and parallel to the horizon. It is produced by reflection of moonlight from vertical faces of ice crystals. A similar circle through the sun is called a PARHELIC CIRCLE.

parhelic circle. A halo consisting of a faint white circle through the sun and parallel to the horizon. It is produced by reflection of sunlight from vertical faces of ice crystals. A similar circle through the moon is called a PARASELENIC CIRCLE. Also called MOCK SUN RING.

parhelion *(pl. parhelia), n.* A form of halo, consisting of an image of the sun at the same altitude as the sun and some distance from usually about 22°, but occasionally about 40°. A similar phenomenon occurring at a distance of 90°, 120°, or 140° from the sun is called a PARANTHELION, and if occurring at a distance of 180° from the sun, an ANTHELION. A similar phenomenon in relation to the moon is called PARASELENE, MOON DOG, or MOCK MOON. The term PARHELION should not be confused with PERIHELION, the orbital point near the sun when the sun is the center of attraction. Also called SUN DOG, MOCK SUN.

parsec, *n.* The distance at which 1 astronomical unit subtends an angle of 1 second of arc. One parsec equals about 206,265 astronomical units or $30{,}857 \times 10^{12}$ meters or 3.26 light years. The name parsec is derived from parallax second.

partial eclipse. An eclipse in which only part of the source of light is obscured. See ECLIPSE.

pascal, *n.* The special name for the derived unit of pressure and stress in the International System of Units; it is 1 newton per square meter.

pass, *n.* 1. A navigable channel leading to a harbor or river. Sometimes called PASSAGE. 2. A break in a mountain range, permitting easier passage from one side of the range to the other; also called COL. 3. A narrow opening through a barrier reef atoll, or sand bar. 4. A single circuit of the earth by a satellite. See also ORBIT. 5. The period of time a satellite is within telemetry range of a data acquisition station.

passage, *n.* 1. A navigable channel, especially one through reefs or islands. Also called PASS. 2. A transit from one place to another; one leg of a voyage.

passing light. A low intensity light which may be mounted on the structure of another light to enable the mariner to keep the latter light in sight when he passes out of its beam. See also SUBSIDIARY LIGHT.

passive satellite. 1. A satellite which contains power source to augment the output signal (i.e., reflected only) as contrasted with ACTIVE SATELLITE; a satellite which is a passive reflector. 2. As defined by the International Telecommunications Union (ITU), an earth satellite intended to transmit radiocommunication signals by reflection.

passive system. A term used to describe a navigation system whose operation does not require the user to transmit a signal.

patent log. A mechanical log, particularly a TAFFRAIL LOG.

patent slip. See MARINE RAILWAY.

path, *n.* See as ORBITAL PATH.

pattern, *n.* 1. See under LATTICE. 2. In a hyperbolic radionavigation system, the family of hyperbolas associated with a single pair of stations, usually the master station and a slave (secondary) station.

P-band. A radio-frequency band of 225 to 390 megahertz. See also FREQUENCY, FREQUENCY BAND.

polar cap anomaly. See under POLAR CAP DISTURBANCE.

peak, *n.* 1. On the sea floor, a prominent elevation, part of a larger feature, either pointed or of very limited extent across the summit. 2. A pointed mountain summit. 3. An individual or conspicuous mountain with a single conspicuous summit, as Pikes Peak. 4. The summit of a mountain. 5. A term sometimes used for a headland or promontory.

peak envelope power. See under POWER (OF A RADIO TRANSMITTER).

pebble, *n.* See under STONES.

pelorus, *n.* A dumb compass, or a compass card (called a PELORUS CARD) without a directive element, suitably mounted and provided with vanes to permit observation of relative bearings unless used in conjunction with a compass to give true or magnetic bearings.

pelorus card. The part of a pelorus on which the direction graduations are placed. It is usually in the form of a thin disk or annulus graduated in degrees, clockwise, from 0° at the reference direction to 360°.

pendulous gyroscope. A gyroscope with its axis of rotation constrained by a suitable weight to remain horizontal. The pendulous gyroscope is the basis of one type of gyrocompass.

peninsula, *n.* A section of land nearly surrounded by water. Frequently, but not necessarily, a peninsula is connected to a larger body of land by a neck or isthmus.

pentagon, *n.* A closed plane figure having five sides.

pentagonal cluster. An arrangement of five corner reflectors, mounted so as to give their maximum response in a horizontal direction, and equally spaced on the circumference of a circle. The response is substantially uniform in all horizontal directions. See also OCTAHEDRAL CLUSTER.

penumbra, *n.* 1. That part of a shadow in which light is partly cut off by an intervening object. The penumbra surrounds the darker UMBRA in which light is completely cut off. 2. The lighter part of a sun spot, surrounding the darker UMBRA.

penumbral lunar eclipse. The eclipse of the moon when the moon passes only through the penumbra of the earth's shadow.

performance monitor. A device used to check the performance of the transmitter and receiver of a radar set. Such device does not provide any indication of performance as it might be affected by the propagation of the radar waves through the atmosphere. An echo box is used in one type of performance monitor called an echo box performance monitor.

per gyrocompass (PGC). Relating to or from the gyrocompass.

periapsis, *n.* See PERICENTER.

periastron, *n.* That point of the orbit of one member of a double star system at which the stars are nearest together. That point at which they are farthest apart is called APASTRON.

pericenter, *n.* In an elliptical orbit, the point in the orbit which is the nearest distance from the focus where the attracting mass is located. the pericenter is at one end of the major axis of the orbital ellipse. The opposite is APOAPSIS, APOCENTER. Also called PERIAPSIS, PERIFOCUS.

perifocus, *n.* See PERICENTER.

perigean range. See under PERIGEAN TIDES.

perigean tidal currents. Tidal currents of increased speed occurring monthly as the result of the moon being in perigee or nearest the earth.

perigean tides. Tides of increased range occurring monthly as the result of the moon being in perigee or nearest the earth. The perigean range of tide is the average semidiurnal range occurring at the time of perigean tides and is most conveniently computed from the harmonic constants. It is larger than the mean range where the type of tide is either semidiurnal or mixed and is of no practical significance where the type of tide is diurnal.

perigee, *n.* The orbital point nearest the earth when the earth is the center of attraction. The orbital point farthest from the earth is called APOGEE. See also APOCENTER, PERICENTER.

perigee-to-perigee period. See ANOMALISTIC PERIOD.

perigon, *n.* An angle of 360°.

perihelion, *n.* That orbital point nearest the sun when the sun is the center of attraction. That point farthest from the sun is called APHELION.

perimeter, *n.* 1. The length of a closed plane curve or the sum of the sides of a polygon. 2. The boundary of a plane figure. Also called PERIPHERY.

period, *n.* 1. The interval needed to complete a cycle. See also NATURAL PERIOD, SIDEREAL PERIOD, SYNODIC PERIOD, WAVE PERIOD). 2. The interval of time between the commencement of two identical successive cycles of the characteristic of the light.

periodic, *adj.* Of or pertaining to a period.

periodic error. An error whose amplitude and direction vary systematically with time.

periodic perturbations. Perturbations to the orbit of a satellite which change direction in regular or periodic manner in time, such that the average effect over a long period of time is zero.

periodic terms. In the mathematical expression of the orbit of a satellite, terms which vary with time in both magnitude and direction in a periodic manner. See also SECULAR TERMS.

period of satellite. 1. See ORBITAL PERIOD. 2. As defined by the International Telecommunication Union (ITU), the time elapsing between two consecutive passages of a satellite or planet through a characteristic point on its orbit.

periphery, *n.* See PERIMETER.

periplus, *n.* The early Greek name for SAILING DIRECTIONS. The literal meaning of the term is "a sailing round."

periscope, *n.* An optical instrument which displaces the line of sight parallel to itself, to permit a view which may otherwise be obstructed.

periscope sextant. A sextant designed to be used in conjunction with the periscope of a submarine.

permafrost, *n.* Permanently frozen subsoil. Any soil or other deposit, including rock, the temperature of which has been below freezing continuously for 2 years or more is considered permafrost.

Permalloy, *n.* The trade name for an alloy of about 80% nickel and 20% iron, which is very easily magnetized and demagnetized.

permanent current. A current that runs fairly continuously and is independent of tides and other temporary causes.

permanent echo. An echo from an object whose position relative to the radar set is fixed.

permanent light. A light used in regular service.

permanent magnetism. The magnetism which is acquired by hard iron, which is not readily magnetized by induction, but which retains a high percentage of magnetism acquired unless subjected to a demagnetizing force. The strength and polarity of this magnetism in a craft depends upon the heading, magnetic latitude, and building stresses imposed during construction. See also INDUCED MAGNETISM, SUBPERMANENT MAGNETISM.

permeability, *n.* 1. The ability to transmit magnetism; magnetic conductivity. 2. The ability to permit penetration or passage. In this sense the term is applied particularly to substances which permit penetration or passage of fluids.

perpendicular, *adj.* At right angles; normal.

perpendicular, *n.* A perpendicular line, plane, etc. A distinction is sometimes made between PERPENDICULAR and NORMAL, the former applying to a line at right angles to a straight line or plane, and the latter referring to a line at right angles to a curve or curved surface.

persistence, *n.* A measure of the time of decay of the luminescence of the face of the cathode ray tube after excitation by the stream of electrons has ceased. Relatively slow decay is indicative of high persistence. Persistence is the length of time during which phosphorescence takes place. See also AFTERGLOW, definition 1.

personal correction. A correction due to personal error. Also called PERSONAL EQUATION.

personal equation. A term used for both PERSONAL ERROR and PERSONAL CORRECTION.

personal error. A systematic error in the observation of a quantity due to the personal idiosyncrasies of the observer. Also called PERSONAL EQUATION.

perspective chart. A chart on a perspective map projection.

perspective map projection. A map projection produced by the direct projection of the points of the ellipsoid (used to represent the earth) by straight lines drawn through them from some given point. The projection is usually made upon a plane tangent to the ellipsoid at the end of the diameter joining the point of projection and the center of the ellipsoid. The plane of projection is usually tangent to the ellipsoid at the center of the area being mapped. he analytical expressions that determine the elements of the projection. If the point of projection is at the center of the ellipsoid, a gnomonic map projection results; if it is at the point opposite the plane's point of tangency a stereographic map projection; and if at infinity (the projecting lines being parallel to each other), an orthographic map projection. Most map projections are not perspective. Also called GEOMETRIC MAP PROJECTION.

perspective map projection upon a tangent cylinder. A cylindrical map projection upon a cylinder tangent to the ellipsoid produced by perspective projection from the ellipsoid's center. The geographic meridians are represented by a family of equally spaced parallel straight lines, perpendicular to a second family of parallel straight lines which represent the geographic parallels of latitude. The spacing, with respect to the equator of the lines which represent the parallels of latitude, increases as the tangent function of the latitude; the line representing 90° latitude is at an infinite distance from the line which represents the equator. Not to be confused with MERCATOR MAP PROJECTION to which it bears a general resemblance.

perspective projection. The representation of a figure on a surface, either plane or curved, by means of projecting lines emanating from a single point, which may be infinity. Also called GEOMETRIC PROJECTION. See also PERSPECTIVE MAP PROJECTION.

per standard compass. Relating to the standard magnetic compass.

per steering compass. Relating to the magnetic steering compass.

perturbations, *n. (pl.).* In celestial mechanics differences of the actual orbit from a central force orbit, arising from some external force such as a third body attracting the other two; a resisting medium (atmosphere); failure of the parent body to act as a point mass, and so forth. Also the forces that cause differences between the actual and reference (central force) orbits. See also GRAVITATIONAL PERTURBATIONS, LONG PERIOD PERTURBATIONS, LUNISOLAR PERTURBATIONS, NONGRAVITATIONAL PERTURBATIONS, PERIODIC PERTURBATIONS, SECULAR PERTURBATIONS, SHORT PERIOD PERTURBATIONS, TERRESTRIAL PERTURBATIONS.

perturbed orbit. The orbit of a satellite differing from its normal orbit due to various disturbing effects, such as nonsymmetrical gravitational effects, atmospheric drag, radiation pressure, and so forth. See also PERTURBATIONS.

perturbing factor. In celestial mechanics, any factor that acts on an orbiting body to change its orbit from a central force orbit. Also called PERTURBING FORCE.

perturbing force. See PERTURBING FACTOR.

Peru Coastal Current. See PERU CURRENT.

Peru Current. A narrow, fairly stable ocean current that flows northward close to the South American coast. It originates off the coast of Chile at about latitude 40°S and flows past Peru and Ecuador to the southwest extremity of Colombia. The southern portion of the Peru Current is sometimes called the CHILE CURRENT. It has sometimes been called the HUMBOLDT CURRENT because an early record of its temperature was taken by the German scientist Alexander von Humboldt in 1802. The name Corriente del Peru was adopted by a resolution of the Ibero-American Oceanographic Conference at its Madrid-Malaga meeting in April 1935. Also called PERU COASTAL CURRENT.

Peru Oceanic Current. See MENTOR CURRENT.

phantom, *n.* That part of a gyrocompass carrying the compass card.

phantom bottom. A false bottom indicated by an echo sounder, some distance above the actual bottom. Such an indication, quite common in the deeper parts of the ocean, is due to large quantities of small organisms.

phantom echo. See PHANTOM TARGET.

phantom target. 1. An indication of an object on a radar display that does not correspond to the presence of an actual object at the point indicated. Also called PHANTOM ECHO. 2. See ECHO BOX.

phase, *n.* The amount by which a cycle has progressed from a specified origin. For most purposes it is stated in circular measure, a complete cycle being considered 360°. See also PHASES OF THE MOON.

phase angle. The angle at a celestial body between the sun and earth.

phase coding. In Loran C, the shifting in a fixed sequence of the relative phase of the carrier cycles between certain pulses of a group. This shifting facilitates automatic synchronization in identical sequence within the group of eight pulses that are transmitted during each group repetition interval. It also minimizes the effect of unusually long skywave transmissions causing one pulse to interfere with the succeeding pulse in the group received by groundwave.

phase inequality. Variations in the tides or tidal currents due to changes in the phase of the moon. At the times of new and full moon the tide-producing forces of the moon and sun act in conjunction, causing the range of tide and speed of the tidal current to be greater than the average, the tides at these times being known as spring tides. At the time of quadrature of the moon these forces are opposed to each other, causing the neap tides with diminished range and current speed.

phase lag. See EPOCH, definition 3.

phase lock. The technique whereby the phase of an oscillator signal is made to follow exactly the phase of a reference signal by first comparing the phases of the two signals and then using the resulting phase difference signal to adjust the reference oscillator frequency to eliminate phase difference when the two signals are next compared.

phase meter. An instrument for measuring the difference in phase of two waves of the same frequency.

phase modulation. The process of changing the phase of a carrier wave in accordance with the variations of a modulating wave. See also MODULATION.

phase reduction. Processing of observed high and low waters to obtain quantities depending upon the phase of the moon, such as the spring and neap ranges of tide. Formerly this process was known as SECOND REDUCTION. Also applicable to tidal currents.

phases of the moon. The various appearances of the moon during different parts of the synodical month. The cycle begins with new moon or change of the moon at conjunction. The visible part of the waxing moon increases in size during the first half of the cycle until full moon appears at opposition, after which the visible part of the waning moon decreases for the remainder of the cycle. First quarter occurs when the waxing moon is at east quadrature; last quarter when the waning moon is at west quadrature. From last quarter to new and from new to first quarter the moon is crescent; from first quarter to full and from full to last quarter it is gibbous. The elapsed time, usually expressed in days, since the last new moon is called age of the moon. The full moon occurring nearest the autumnal equinox is called harvest moon; the next full moon, hunter's moon.

phase synchronized. A term used to indicate that radio wave transmissions have the same phase at their sources at any instant of time.

phenomenon *(pl. phenomena), n.* 1. An occurrence or event capable of being explained scientifically, particularly one relating to the unusual. 2. A rare or unusual event.

phonetic alphabet. A list of standard words used to identify letters in a message transmitted by radio or telephone.

phosphor, *n.* A phosphorescent substance which emits light when excited by radiation, as on the scope of a cathode-ray tube.

phosphorescence, *n.* Emission of light without sensible heat, particularly as a result of but continuing after absorption of radiation from some other source. PERSISTENCE is the length of time during which phosphorescence takes place. The emission of light or other radiant energy as a result of and only during absorption of radiation from some other source is called FLUORESCENCE.

photogrammetry, *n.* 1. The science of obtaining reliable measurements from photographic images. 2. The science of preparing charts and maps from aerial photographs using stereoscopic equipment and methods.

photosphere, *n.* The bright portion of the sun visible to the unaided eye.

physical double star. Two stars in nearly the same line of sight and at approximately the same distance from the observer, as distinguished from an OPTICAL DOUBLE STAR (two stars in nearly the same line of sight but differing greatly in distance from the observer). If they revolve about their common center of mass, they are called a **binary star**.

pico-. A prefix meaning one-trillionth (10^{-12}).

piedmont, *n.* An area of hills situated at the base of a range of mountains.

pier, *n.* 1. A structure extending into the water from a shore or a bank which provides berthing for ships, or use as a promenade or fishing pier. See also WHARF. 2. A support for the spans of a bridge.

pierhead, *n.* The outer end of a pier or jetty.

pile, *n.* A long, heavy timber or section of steel, concrete, etc., forced into the earth to serve as a support, as for a pier, or to resist lateral pressure.

pile beacon. A beacon formed of one or more piles.

pile dolphin. A minor light structure consisting of a number of piles driven into the bottom in a circular pattern and drawn together with a light mounted at the top. Referred to in the *Light List* as a DOLPHIN.

pillar buoy. A buoy composed of a tall central structure mounted on a broad flat base.

pilot, *n.* 1. A person who directs the movement of a vessel through pilot waters, usually a person who has demonstrated extensive knowledge of channels, aids to navigation, dangers to navigation, etc., in a particular area and is licensed in that area. See also LOCAL KNOWLEDGE. 2. A book of sailing directions. For waters the United States and its possessions, They are prepared by the National Ocean Survey, and are called COAST PILOTS.

pilotage, *n.* 1. The services of especially qualified navigators having local knowledge who assist in the navigation of vessels in particular areas. Also called PILOTAGE SERVICE. 2. A term loosely used for piloting.

pilotage service. See PILOTAGE, definition 1.

pilotage waters. See PILOT WATERS.

pilot boat. A small vessel used by the pilot to go or from a vessel employing his services. Also called PILOT VESSEL.

pilot chart. A chart of a major ocean area which presents in graphic form averages obtained from weather, wave, ice, and other marine data gathered over many years in meteorology and oceanography to aid the navigator in selecting the quickest and safest routes; published by the Defense Mapping Agency Hydrographic/Topographic Center from data provided by the U.S. Naval Oceanographic Office and the Environmental Data and Information Service of the National Oceanic and Atmospheric Administration.

piloting, *n.* Navigation involving frequent or continuous determination of position relative to observed geographical points, to a high order of accuracy; directing the movements of a vessel near a coast by means of terrestrial reference points is called coast piloting. Sometimes called PILOTAGE. See also PILOTAGE, definition 1.

pilot rules. Regulations supplementing the Inland Rules of the Road, superseded by the adoption of the Inland Navigation Rules in 1980 (1983 on the Great Lakes).

pilot station. The office or headquarters of pilots; the place where the services of a pilot may be obtained.

pilot vessel. See PILOT BOAT.

pilot waters. 1. Areas in which the services of a marine pilot are essential. 2. Waters in which navigation is by piloting. Also called PILOTAGE WATERS.

pinnacle, *n.* A high tower or spire-shaped pillar of rock or coral on the sea floor, alone or cresting a summit. It may or may not be a hazard to surface navigation. Due to the steep rise from the sea floor no warning is given by sounding.

pinnacled iceberg. An iceberg weathered in such manner as to produce spires or pinnacles. Also called PYRAMIDAL ICEBERG, IRREGULAR ICEBERG.

pip, *n.* See BLIP.

pitch, *n.* 1. Oscillation of a vessel about the transverse axis due to the vessel's bow and stern being raised or lowered on passing through successive crests and troughs of waves. Also called PITCHING. See also SHIP MOTIONS. 2. The distance a propeller would advance longitudinally in one revolution if there were no slip.

pitch, *v., i.* To oscillate about the transverse axis. See also SHIP MOTIONS.

pitching, *n.* See PITCH, definition 1.

pivot point. The point on the centerline between the bow and the center of gravity at which the resultant of the velocities of rotation and translation is directed along the centerline, after a ship has assumed its drift angle in a turn. To an observer on board, the ship appears to rotate about this point.

pixel. The smallest area of phosphors on a video terminal that can be excited to form a picture element.

place name. See TOPONYM.

plain, *n.* On the sea floor, a flat, gently sloping or nearly level region. Sometimes called ABYSSAL PLAIN in very deep water.

plan, *n.* 1. An orthographic drawing or view on a horizontal plane, as of an instrument, a horizontal section, or a layout. 2. A large-scale map or chart of a small area, generally showing at increased scale a portion of the chart on which it is placed.

planar, *adj*. Lying in a plane.

plane, *n.* A surface without curvature, such that a straight line joining any two of its points lies wholly on the surface.

plane of polarization. With respect to a plane polarized wave, the plane containing the electric field vector and the direction of propagation.

plane polarized wave. An electromagnetic wave the electric field vector of which lies at all times in a fixed plane which contains the direction of propagation.

plane sailing. A method of solving the various problems involving a single course and distance, difference of latitude, and departure, in which the earth, or that part traversed. is considered as a plane surface.

planet, *n.* A celestial body of a solar system, in orbit around the sun or a star and shining by reflected light. The larger of such bodies are sometimes called major planets to distinguish them from minor planets (asteroids) which are very much smaller. Larger planets may have satellites. In the solar system an inferior planet has an orbit smaller than that of the earth; a superior planet has an orbit larger than that of the earth. The four planets commonly used for celestial observations are called navigational planets. The word planet is of Greek origin, meaning, literally, wanderer, applied because the planets appear to move relative to the stars.

planetary, *adj*. Of a planet or the planets; terrestrial; worldwide.

planetary aberration. See under ABERRATION definition 1.

planetary configurations. Apparent positions of the planets relative to each other and to other bodies of the solar system, as seen from the earth.

planetary precession. The component of general precession caused by the effect of other planets on the equatorial protuberance of the earth producing an eastward motion of the equinoxes along the ecliptic. See also PRECESSION OF THE EQUINOXES.

planetoid, *n.* See ASTEROID.

plane triangle. A closed plane figure having three straight lines as sides.

planimetric map. A map indicating only the horizontal positions of features, without regard to elevation, in contrast with a TOPOGRAPHIC MAP, which indicates both horizontal and vertical positions.

planisphere, *n.* A representation on a plane of the celestial sphere, especially one on a polar projection, with means provided for making certain measurements such as altitude and azimuth. See also STAR FINDER.

plankton, *n.* Floating, drifting, or feebly swimming plant and animal organisms of the sea. These are usually microscopic or very small, although jellyfish are included.

planning chart. A chart designed for use in planning voyages or flight operations or investigating areas of marine or aviation activities.

plan position indicator. An intensity-modulated radar display in which the radial sweep rotates on the cathode-ray tube in synchronism with the rotating antenna. The display presents a maplike representation of the positions of echo-producing objects. It is generally one of two main types: RELATIVE MOTION DISPLAY or TRUE MOTION DISPLAY.

plastic relief map. A topographic map printed on plastic and molded into a three-dimensional form.

plateau, *n.* On the sea floor, a comparatively flat-topped feature of considerable extent, dropping off abruptly on one or more sides.

plate glass. A fine quality sheet glass obtained by rolling, grinding, and polishing.

platform erection. In the alignment of inertial navigation equipment, the alignment of the stable platform vertical axis with the local vertical.

platform tide. See STAND.

Platonic year. See GREAT YEAR.

Plimsoll mark. A mark on a ship's side indicating how deeply she may be loaded.

plot, *n.* A drawing consisting of lines and points representing certain conditions graphically, as the progress of a craft. See also NAVIGATIONAL PLOT.

plot, *v., t.* To draw lines and points to represent certain conditions graphically, as the various lines and points on a chart or plotting sheet representing the progress of a vessel, a curve of magnetic azimuths vs. time or of altitude vs. time, or a graphical solution of a problem, such as a relative motion solution.

plotter, *n.* An instrument used for plotting straight lines and measuring angles on a chart or plotting sheet. See also PROTRACTOR.

plotting chart. An outline chart on a specific scale and projection, usually showing a graticule and compass rose, designed to be used ancillary to a standard nautical chart, and produced either as an independent chart or part of a coordinated series. See also POSITION PLOTTING SHEET.

plotting head. See REFLECTION PLOTTER.

plumb bob. A conical device, usually of brass and suspended by a chord, by means of which a point can be projected vertically into space over relatively short distances.

plumb-bob vertical. See LOCAL VERTICAL.

plumb line. 1. A line in the direction of gravity. 2. A cord with a weight at one end for determining the direction of gravity.

pluvial, *adj*. Of or pertaining to rain. The expression pluvial period is often used to designate an extended period or age of heavy rainfall.

P.M. Abbreviation for Post Meridian; after noon in zone time.

pocosin, *n.* See DISMAL.

point, *n.* 1. A place having position, but no extent. 2. A tapering piece of land projecting into a body of water. It is generally less prominent than a CAPE. 3. One thirty-second of a circle, or 11 1/4°. Also called COMPASS POINT when used in reference to compass directions. See also FOUR-POINT BEARING.

point designation grid. A system of lines, having no relation to the actual scale or orientation, drawn on a map, chart, or air photograph, dividing it into squares so that points can be more readily located.

point light. A luminous signal without perceptible length, as contrasted with a LINEAR LIGHT which has perceptible length.

point of arrival. The position at which a craft is assumed to have reached or will reach after following specified courses for specified distance from a point of departure. See also DESTINATION.

point of departure. The point from which the initial course to reach the destination begins. It is usually established by bearings of prominent landmarks as the vessel clears a harbor and proceeds to sea. When a person establishes this point, he is said to take departure. Also called the DEPARTURE.

point of destination. See DESTINATION.

point of inflection. The point at which a reverse in direction of curvature takes place.

polar, *adj*. Of or pertaining to a pole or the poles.

polar air. A type of air whose characteristics are developed over high latitudes, especially Within the subpolar highs. Continental polar air has low surface temperature, low moisture content, and especially in its source regions, has great stability in the lower layers. It is shallow in comparison with arctic air. Maritime polar air initially possesses similar properties to those of continental polar air, but in passing over warmer water it becomes unstable with a higher moisture content.

polar axis. 1. The straight line connecting the poles of a body 2. A reference line for one of the spherical coordinates.

polar cap absorption. See under POLAR DISTURBANCE.

polar cap disturbance. An ionospheric disturbance (which does not refer to the ice cap in the polar regions). It is a result of the focusing effect that the earth's magnetic field has on particles released from the sun during a solar proton event. The effect concentrates high-energy particles in the region of the magnetic pole with the result that normal very low frequency Omega propagation is disrupted. The effect on radio waves is known as POLAR CAP ABSORPTION (PCA). Historically, polar cap disturbances (PCDs) produced large or total absorption of high frequency radio waves crossing the polar region, hence the term POLAR CAP ABSORPTION. A transmission path which is entirely outside the polar region is unaffected by a PCD. The PCDs, often called PCA EVENTS (PCAs), may persist for a week or more, but duration of only a few days is more common. The PCD can cause line of position errors about 6 to 8 nautical miles.

The *Omega Propagation Correction Tables* make no allowance for this phenomenon since it is not predictable. However, the frequency of the phenomenon increases during those years of peak solar activity. See also SUDDEN IONOSPHERIC DISTURBANCE, MODAL INTERFERENCE.

polar chart. 1. A chart of polar areas. 2. A chart on a polar projection. The projections most used for polar charts are the gnomonic, stereographic, azimuthal equidistant, transverse Mercator, and modified Lambert conformal.

polar circles. The minimum latitudes, north and south, at which the sun becomes circumpolar.

polar continental air. Air of an air mass that originates over land or frozen ocean areas in polar regions. Polar continental air is characterized by low temperature, stability, low specific humidity, and shallow vertical extent.

polar coordinates. A system of coordinates defining a point by its distance and direction from a fixed point, called the POLE. Direction is given as the angle between a reference radius vector and a radius vector to the point. If three dimensions are involved, two angles are used to locate the radius vector. See also SPACE-POLAR COORDINATES.

polar distance. Angular distance from a celestial pole; the arc of an hour circle between a celestial pole, usually the elevated pole, and a point on the celestial sphere, measured from the celestial pole through 180°. See also CODECLINATION.

polar front. The semi-permanent, semi-continuous front separating air masses of tropical and polar origin. This is the major front in terms of air mass contrast and susceptibility to cyclonic disturbance.

Polaris correction. A correction to be applied to the corrected sextant altitude of Polaris to obtain latitude. This correction for the offset of Polaris from the north celestial pole varies with the local hour angle of Aries, latitude, and date. See Q-CORRECTION.

polarization, *n*. The attribute of an electromagnetic wave which describes the direction of the electric field vector.

polarization error. An error in a radio direction finder bearing or the course indicated by a radiobeacon because of a change in the polarization of the radio waves between the transmitter and receiver on being reflected and refracted from the ionosphere. Because the medium frequency radio direction finder normally operates with vertically polarized waves, a change to horizontal polarization in the process of reflection and refraction of the waves from the ionosphere can have a serious effect on bearing measurements. If the horizontally polarized skywaves are of higher signal strength than the vertically polarized groundwaves, the null position for the loop antenna cannot be obtained. If the skywaves are of lower signal strength than the groundwaves, the null position is made less distinct. Before the cause of the error was understood, it was called NIGHT EFFECT or NIGHT ERROR because it occurs principally during the night, and especially during twilight when rapid changes are occurring in the ionosphere.

polar map projection. A map projection centered on a pole.

polar maritime air. An air mass that originates in the polar regions and is then modified by passing over a relatively warm ocean surface. It is characterized by moderately low temperature, moderately high surface specific humidity, and a considerable degree of vertical instability. When the air is colder than the sea surface, it is further characterized by gusts and squalls, showery precipitation, variable sky, and good visibility between showers.

polar motion. See EULERIAN MOTION.

polar navigation. Navigation in polar regions, where unique considerations and techniques are applied. No definite limit for these regions is recognized but polar navigation techniques are usually used from about latitude 70°N.

polar orbit. An earth satellite orbit that has an inclination of about 90° and, hence, passes over or near the earth's poles.

polar orthographic map projection. An orthographic map projection having the plane of the projection perpendicular to the axis of rotation of the earth, in this projection, the geographic parallels are full circles, true to scale, and the geographic meridians are straight lines.

polar regions. The regions near the geographic poles. No definite limit for these regions is recognized.

polar satellite. A satellite that passes over or near the earth's poles, i.e., a satellite whose orbital plane has an inclination of about 90° to the plane of the earth's equator.

polar stereographic map projection. A stereographic map projection having the center of the projection located at a pole of the sphere.

pole, *n*. 1. Either of the two points of intersection of the surface of a sphere or spheroid and its axis, labeled N or S to indicate whether the north pole or south pole. The two points of intersection of the surface of the earth with its axis are called geographical poles. The two points of intersection of the celestial sphere and the extended axis of the earth are called celestial poles. The celestial pole above the horizon is called the elevated pole; that below the horizon the depressed pole. The ecliptic poles are 90° from the ecliptic. Also, one of a pair of similar points on the surface of a sphere or spheroid, as a magnetic pole, definition l; a geomagnetic pole; or a fictitious pole. 2. A magnetic pole, definition 2. 3. The origin of measurement of distance in polar or spherical coordinates. 4. Any point around which something centers.

pole beacon. A vertical spar fixed in the ground or in the sea bed or a river bed to show as a navigation mark. Sometimes called SPINDLE BEACON or SINGLE-PILE BEACON in the United States.

polyconic, *adj*. Consisting of or related to many cones.

polyconic chart. A chart on the polyconic map projection.

polyconic map projection. A conic map projection in which the surface of a sphere or spheroid, such as the earth, is conceived as developed on a series of tangent cones, which are then spread out to form a plane. A separate cone is used for each small zone. This projection is widely used for maps but seldom used for charts, except for survey purposes. It is not conformal.

polygon, *n*. A closed plane figure bounded by straight lines. See also HEXAGON, OCTAGON, PARALLELOGRAM, PENTAGON, QUADRILATERAL, RECTANGLE, SQUARE, TRAPEZOID, TRIANGLE.

polynya, *n*. A non-linear shaped area of water enclosed by ice. Polynyas may contain brash ice and/or be covered with new ice, nilas, or young ice; submariners refer to these as SKYLIGHTS. Sometimes the POLYNYA is limited on one side by the coast and is called a SHORE POLYNYA or by fast ice and is called a FLAW POLYNYA. If it recurs in the same position every year, it is called a RECURRING POLYNYA.

polyzoa, *n., pl*. Very small marine animals which reproduce by budding, many generations often being permanently connected by branchlike structures. These animals are often very numerous and in some areas they cover the bottom. Also called BRYOZOA.

pond, *n*. A relatively small body of water, usually surrounded on all sides by land. A larger body of water is called a LAKE.

pontoon, *n*. A float or low, flat-bottomed vessel to float machinery such as cranes, capstans, etc. or to support weights such as floating bridges boat landings, etc.

pool, *n*. 1. A small body of water, usually smaller than a pond, especially one that is quite deep. One left by an ebb tide is called a **tide pool**. 2. A small and comparatively still, deep part of a larger body of water such as a river or harbor.

poop, *n*. A short enclosed structure at the stern of a vessel, extending from side to side. It is covered by the poop deck, which is surrounded by the poop rail.

pooped. To have shipped a sea or wave over the stern.

pororoca, *n*. See TIDAL BORE.

port, *n*. 1. A place provided with moorings and transfer facilities for loading and discharging cargo or passengers, usually located in a harbor. 2. The left side of a craft, facing forward. The opposite is STARBOARD.

portfolio, *n*. A portable case for carrying papers. See also CHART PORTFOLIO.

port hand buoy. A buoy which is to be left to the port side when approaching from the open sea or proceeding in the direction of the main stream of flood current, or in the direction established by appropriate authority.

port of call. A port visited by a ship.

Portugal Current. A slow-moving current that is the prevailing southward flow off the Atlantic coasts of Spain and Portugal. Its speed averages only about 0.5 knot during both winter and summer. The maximum speed seldom exceeds 2.0 knots north of latitude 40°N and 2.5 knots south of 40°N. It is easily influenced by winds.

Portuguese norther. See under NORTHER.

position, *n.* A point defined by stated or implied coordinates, particularly one on the surface of the earth. A fix is a relatively accurate position determined without reference to any former position. A running fix is a position determined by crossing lines of position obtained at different times and advanced or retired to a common time. An estimated position is determined from incomplete data or data of questionable accuracy. A dead reckoning position is determined by advancing a previous position for courses and distances. A most probable position is a position judged to be most accurate when an element of doubt exists as to the true position. It may be a fix, running fix, estimated position, or dead reckoning position depending upon the information upon which it is based. An assumed position is a point at which a craft is assumed to be located. A geographical position is that point on the earth at which a given celestial body is in the zenith at a specified time, or any position defined by means of its geographical coordinates. A geodetic position is a point on the earth the coordinates of which have been determined by triangulation from an accurately known initial station, or one defined in terms of geodetic latitude and longitude. An astronomical position is a point on the earth whose coordinates have been determined as a result of observation of celestial bodies, or one defined in terms of astronomical latitude and longitude. A maritime position is the location of a seaport or other point along a coast. A relative position is one defined with reference to another position, either fixed or moving. See also PINPOINT, LINE OF POSITION, BAND OF POSITION, SURFACE OF POSITION.

position angle. See PARALLACTIC ANGLE.

position approximate. Of inexact position. The expression is used principally on charts to indicate that the position of a wreck, shoal, etc., has not been accurately determined or does not remain fixed.

position buoy. An object towed astern to assist a following vessel in maintaining the desired or prescribed distance, particularly in conditions of low visibility.

position circle. 1. The chart symbol denoting the position of a buoy. 2. See CIRCLE OF POSITION.

position doubtful. Of uncertain position. The expression is used principally on charts to indicate that a wreck, shoal, etc., has been reported in various positions and not definitely determined in any. See also VIGIA.

positioning, *n.* The process of determining, at a particular point in time, the precise physical location of a craft, vehicle, person or site.

position line. See LINE OF POSITION.

position plotting sheet. A blank chart, usually on the Mercator projection, showing only the graticule and a compass rose. The meridians are usually unlabeled by the publisher so that they can be appropriately labeled when the chart is used in any longitude. It is designed and intended for use in conjunction with the standard nautical chart. See also SMALL AREA PLOTTING SHEET, UNIVERSAL PLOTTING SHEET, PLOTTING CHART.

post meridian (PM). After noon, or the period of time between noon (1200) and midnight (2400). The period between midnight and noon is called ANTE MERIDIAN.

potential, *n.* The difference in voltage at two points in a circuit.

potential energy. Energy possessed by a body by virtue of its position, in contrast with KINETIC ENERGY, that possessed by virtue of its motion.

pound, *n.* A unit of mass equal to 0.45359237 kilograms. Also called AVOIRDUPOIS POUND.

pound, *v., i.* To strike oncoming waves repeatedly or heavily.

pounding, *n.* A series of shocks received by a pitching vessel as it repeatedly or heavily strikes the water in a heavy sea. The shocks can be felt over the entire vessel and each one is followed by a short period of vibration.

power, *n.* 1. Rate of doing work. 2. Luminous intensity. 3. The number of times an object is magnified by an optical system, such as a telescope. Usually called MAGNIFYING POWER. 4. The result of multiplying a number by itself a given number of times. See also EXPONENT.

power gain (of an antenna). See DIRECTIVITY, definition 2.

power gain (of a transmitter). The ratio of the output power delivered to a specified load by an amplifier to the power absorbed by its input circuit.

power (of a radio transmitter), *n.* The power of a radio transmitter is expressed in one of the following forms: The peak envelope power is the average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the highest crest of the modulation envelope, taken under conditions of normal operation. The mean power is the power supplied to the antenna transmission line by a transmitter during normal operation, averaged over a time sufficiently long compared with the period of the lowest frequency encountered in the modulation. The carrier power is the average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle under conditions of no modulation. This definition does not apply to pulse modulated emissions.

PPI display. See as PLAN POSITION INDICATOR.

PPI repeater. See RADAR REPEATER.

precautionary area. A routing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended. See also ROUTING SYSTEM.

precession, *n.* The change in the direction of the axis of rotation of a spinning body, as a gyroscope, when acted upon by a torque. The direction of motion of the axis is such that it causes the direction of spin of the gyroscope to tend to coincide with that of the impressed torque. The horizontal component of precession is called drift, and the vertical component is called topple. Also called INDUCED PRECESSION, REAL PRECESSION. See also APPARENT PRECESSION, PRECESSION OF THE EQUINOXES.

precession in declination. The component of general precession along a celestial meridian, amounting to about 20.0" per year.

precession in right ascension. The component of general precession along the celestial equator, amounting to about 46.1" per year.

precession of the equinoxes. The conical motion of the earth's axis about the vertical to the plane of the ecliptic, caused by the attractive force of the sun, moon, and other planets on the equatorial protuberance of the earth. The effect of the sun and moon, called lunisolar precession, is to produce a westward motion of the equinoxes along the ecliptic. The effect of other planets, called planetary precession, tends to produce a much smaller motion eastward along the ecliptic. The resultant motion, called general precession, is westward along the ecliptic at the rate of about 50.3" per year. The component of general precession along the celestial equator, called precession in right ascension, is about 46.1" per year and the component along a celestial meridian, called precession in declination, is about 20.0" per year.

precipice, *n.* A high and very steep cliff.

precipitation, *n.* 1. Any or all forms of water particles, whether liquid or solid, that fall from the atmosphere and reach the ground. It is distinguished from cloud, fog, dew, rime, frost, etc., in that it must fall; and it is distinguished from cloud and virga in that it must reach the ground. Precipitation includes drizzle, rain, snow, snow pellets, snow grains, ice crystals, ice pellets, and hail. 2. The amount usually expressed in inches of liquid water depth, of the water substance that has fallen at a given point over a specified period of time.

precipitation static. A type of interference experienced in a radio receiver, during snow storms, rain storms, and dust storms, caused by the impact of dust particles against the antenna. It may also be caused by the existence of induction fields created by nearby corona discharges.

precipitation trails. See VIRGA.

precision, *n.* A measure of how close the outcome of a series of observations or measurement cluster about some estimated value of a desired quantity. Precision implies repeatability of the observations within some specified limit and depends upon the random errors encountered due to the quality of the observing instrument, the skill of the observer and randomly fluctuating conditions such as temperature, pressure, refraction, etc. Precision should not be confused with

ACCURACY. Observations may be of high precision but inaccurate due to the presence of systematic errors. For a quantity to be accurately measured, both systematic and random errors should be small. For a quantity to be known with high precision, only the random errors due to irregular effects need to be small. See ERROR.

precision graphic recorder. A device used with the standard hydrographic echo sounder in ocean depths where soundings cannot be recorded on the expanded scale of the standard recorder. It provides a sounding record with a scale expansion and high accuracy. Commonly called a PGR.

precision index. A measure of the magnitude of the random errors of a series of observations of some given quantity. If the precision index is large, most of the random errors of the observations are small. The precision index appears as a parameter in the normal (Gaussian) distribution law. While making a series of observations, the standard deviation can be calculated. The precision index is then calculated using a formula and a measure of the precision of the observing instrument is obtained. See also RANDOM ERROR, NORMAL DISTRIBUTION, PRECISION, STANDARD DEVIATION.

precomputation, *n.* The process of making navigational solutions in advance; applied particularly to the determination of computed altitude and azimuth before making a celestial observation for a line of position. When this is done, the observation must be made at the time used for the computation, or a correction applied.

precomputed altitude. The altitude of a celestial body computed before observation, and with the sextant altitude corrections applied with reversed sign. When a precomputed altitude has been calculated, the altitude difference can be determined by comparison with the sextant altitude.

precomputed curve, A graphical representation of the azimuth or altitude of a celestial body plotted against time for a given assumed position, computed for use with celestial observations.

predictability, *n.* In a navigation system, the measure of the accuracy with which the system can define the position in terms of geographical coordinates. See also REPEATABILITY, definition 2.

predicable accuracy. The accuracy of predicting position with respect to precise space and surface coordinates. See also REPEATABLE ACCURACY.

predicted tides. The times and heights of the tide as given in the Tide Tables in advance of their occurrence.

predicting machine. See TIDE PREDICTING MACHINE.

preferred datum. A geodetic datum selected as a base for consolidation of local independent datums within a geographical area. Also called MAJOR DATUM.

pressure, *n.* Force per unit area. The pressure exerted by the weight of the earth's atmosphere is called atmospheric or, if indicated by a barometer, barometric pressure. Pressure exerted by the vapor of a liquid is called vapor pressure. The pressure exerted by a fluid as a result of its own weight or position is called static pressure. Pressure exerted by radiant energy is called radiation pressure.

pressure gage. A tide gage that is operated by the change in pressure at the bottom of a body of water due to rise and fall of the tide.

pressure tendency. The character and amount of atmospheric pressure change for a 3-hour or other specified period ending at the time of observation. Also called BAROMETRIC TENDENCY.

prevailing westerlies. The prevailing westerly winds on the poleward sides of the sub-tropical high-pressure belts.

prevailing wind. The average or characteristic wind at any place.

primary, *n.* See PRIMARY BODY.

primary body. The celestial body or central force field about which a satellite orbits, or from which it is escaping, or towards which it is falling. The primary body of the earth is the sun, the primary body of the moon is the earth. Usually shortened to PRIMARY.

primary circle. See PRIMARY GREAT CIRCLE.

primary control tide station. A tide station at which continuous observations have been made over a minimum of a 19-year Metonic cycle. Its purpose is to provide data for computing accepted values of the harmonic and non harmonic constants essential to tide predictions and to the determination of tidal datums for charting and coastal boundaries. The data series from this station serves as a primary control for the reduction of relatively short series from subordinate tide stations through the method of comparisons of simultaneous observations, and for monitoring long-period sea-level trends and variations. See also TIDE STATION; SUBORDINATE TIDE STATION, definition 1; SECONDARY CONTROL TIDE STATION; TEMPORARY TIDE STATION.

primary great circle. A great circle used as the origin of measurement of a coordinate; particularly such a circle 90° from the poles of a SYSTEM of spherical coordinates, as the equator. Also called PRIMARY CIRCLE, FUNDAMENTAL CIRCLE.

primary radar. 1. Radar which transmits a SIGNAL and receives the incident energy reflected from an object to detect the object. 2. As defined by the International Telecommunications Union (ITU), a radio-determination system based on the comparison of reference signals with radio signals reflected from a position to be determined.

primary seacoast light. A light established for purpose of making landfall or coastwise past from headland to headland. Also called LAND FALL LIGHT.

primary tidal bench mark. See under BENCH MARK.

primary tide station. See PRIMARY CONTROL TIDE STATION.

prime fictitious meridian. The reference meridian (real or fictitious) used as the origin for measurement of fictitious longitude. Prime grid meridian is the reference meridian of a grid; prime transverse or prime inverse meridian is the reference meridian of a transverse graticule; prime oblique meridian is the reference fictitious meridian of an oblique graticule.

prime grid meridian. The reference meridian of a grid. In polar regions it is usually the 180°-0° geographic meridian, used as the origin for measuring grid longitude.

prime inverse meridian. See PRIME TRANSVERSE MERIDIAN.

prime meridian. The 0° meridian of longitude, used as the origin for measurement of longitude The meridian of Greenwich, England, is almost universally used for this purpose. See also PRIME FICTITIOUS MERIDIAN.

prime oblique meridian. The reference fictitious meridian of an oblique graticule.

prime transverse meridian. The reference meridian of a transverse graticule. Also called PRIME INVERSE MERIDIAN.

prime vertical. See PRIME VERTICAL CIRCLE.

prime vertical circle. The vertical circle perpendicular to the principal vertical circle. The intersections of the prime vertical circle with the horizon define the east and west points of the horizon. Often shortened to PRIME VERTICAL; Sometimes called TRUE PRIME VERTICAL to distinguish from magnetic, compass, or grid prime vertical, defined as the vertical circle passing through the magnetic, compass, or grid east and west points of the horizon, respectively.

priming of tide. The periodic acceleration in the time of occurrence of high and low waters due changes in the relative positions of the moon and the sun. Priming occurs when the moon between new and first quarter and between full and third quarter. High tide occurs before transit of the moon. Lagging occurs when the moon is between first quarter and full and between third quarter and new. High tide occurs after transit of the moon. See also LAGGING OF TIDE.

principal vertical circle. The vertical circle passing through the north and south celestial poles. The intersection of the principal vertical circle with the horizon defines the north and south points of the horizon.

priority blanking. See DUAL-RATE BLANKING.

prism, *n.* A solid having parallel, similar, equal, plane geometric figures as bases, and parallelograms as sides. By extension, the term is also applied to a similar solid having nonparallel bases, and trapezoids or a combination of trapezoids and parallelograms as sides. Prisms are used for changing the direction of motion of a ray of light and for forming spectra.

prismatic error. That error due to lack of parallelism of the two faces of an optical element, such as a mirror or a shade glass. See also SHADE ERROR.

private aids to navigation. In United States waters, those aids to navigation not established and maintained by the U.S. Coast Guard. Private aids include those established by other federal agencies with prior U.S. Coast Guard approval, aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the U.S. Coast Guard, and those aids which are merely desired, for one reason or another, by the individual corporation, state or local government or other body that has established the aid with U.S. Coast Guard approval.

probable error. A measure of the dispersion or spread of a series of observations about some value, usually the mean or average value of all the observations. See also CIRCULAR ERROR PROBABLE.

processor. The brain of a computer, which executes programs to do work. Also known more correctly as the CENTRAL PROCESSING UNIT (CPU).

production platform. A term used to indicate a permanent offshore structure equipped to control the flow of oil or gas. For charting purposes, the use of the term is extended to include all permanent platforms associated with oil or gas production, e.g. field terminal, drilling and accommodation platforms, and "booster" platforms sited at intervals along some pipelines. It does not include entirely submarine structures.

prognostic chart. A chart showing, principally, the expected pressure pattern of a given synoptic chart at a specified future time. Usually, positions of fronts are also included, and the forecast values of other meteorological elements may be superimposed.

program. A set of instructions which a computer executes to perform work. Programs are written in one of many LANGUAGES, which translate the instructions into MACHINE LANGUAGE used by the PROCESSOR.

progressive wave. In the ocean, a wave that advances in distance along the sea surfaces or at some intermediate depth. Although the wave form itself travels significant distances, the water particles that make up the wave merely describe circular (in relatively deep water) or elliptical (in relatively shallow water) orbits. With high, steep, wind waves, a small overlap in the orbit motion becomes significant. This overlapping gives rise to a small net transport.

prohibited area. 1. An area shown on nautical charts within which navigation and/or anchoring is prohibited except as authorized by appropriate authority. 2. A specified area within the land areas of a state or territorial waters adjacent thereto over which the flight of aircraft is prohibited. See also DANGER AREA, RESTRICTED AREA.

projection, *n*. The extension of lines or planes to intersect a given surface; the transfer of a point from one surface to a corresponding position on another surface by graphical or analytical means. See also MAP PROJECTION.

projector compass. A magnetic compass in which the lubber's line and compass card, or a portion thereof, are viewed as an image projected through a system of lenses upon a screen adjacent to the helmsman's position. See also REFLECTOR COMPASS.

prolate cycloid. See TROCHOID.

prolate spheroid. An ellipsoid of revolution, the longer axis of which is the axis of revolution. An ellipsoid of revolution, the shorter axis of which is the axis of REVOLUTION, is called an OBLATE SPHEROID.

promontory, *n*. High land extending into a large body of water beyond the line of the coast. Called HEADLAND when the promontory is comparatively high and has a steep face. Also called FORELAND.

propagation, *n*. The travel of waves of energy through or along a medium other than a specially constructed path such as an electrical circuit.

proper motion. The component of the space motion of a celestial body perpendicular to line of sight, resulting in the change of a stars apparent position relative to other stars. Proper motion is expressed in angular units.

proportional dividers. An instrument consisting in its simple form of two legs pointed at both ends and provided with an adjustable pivot, so that for any given pivot setting, the distance between one set of pointed ends always bears the same ratio to the distance between the other set. A change in the pivot changes the ratio. The dividers are used in transferring measurements between charts or other graphics which are not the same scale.

proportional parts. Numbers in the same proportion as a set of given numbers. Such numbers are used in an auxiliary interpolation table based on the assumption that the tabulated quantity and entering arguments differ in the same proportion. For each intermediate argument a "proportional part" or number is given to be applied the preceding tabulated value in the main table.

protractor, *n*. An instrument for measuring angles on a surface; an angular scale. In its most usual form it consists of a circle or part of one (usually a semicircle) graduated in degrees. See also COMPASS ROSE, THREE-ARM PROTRACTOR.

province, *n*. On the sea floor, a region identifiable by a group of similar physiographic features whose characteristics are markedly in contrast with surrounding areas.

pseudo-independent surveillance. Position determination that relies on craft or vehicle cooperation but is not subject to craft or vehicle navigational errors (e.g., secondary radar).

psychrometer, *n*. A type of hygrometer (an instrument for determining atmospheric humidity) consisting of dry-bulb and wet-bulb thermometers. The dry-bulb thermometer indicates the temperature of the air, and the wet bulb thermometer the lowest temperature to which air can be cooled by evaporating water into it at constant pressure. With the information obtained from a psychrometer, the humidity, dew point, and vapor pressure for any atmospheric pressure can be obtained by means of appropriate tables.

psychrometric chart. A nomogram for graphically determining relative humidity, absolute humidity, and dew point from wet- and dry-bulb thermometer readings.

pteropod *(pl. pteropoda), n*. A small marine animal with or without a shell and having two thin, winglike feet. These animals are often so numerous they may cover the surface of the sea for miles. In some areas, their shells cover the bottom.

Pub. No. 9. The American Practical Navigator. A publication of the Defense Mapping Agency Hydrographic/Topographic Center, originally by Nathaniel Bowditch (1773-1838) and first published in 1802, comprising a complete manual of navigation with tables for solution of navigational problems. Popularly called BOWDITCH.

Pub. No. 102. International Code of Signals. A publication of the Defense Mapping Agency Hydrographic/Topographic Center intended primarily for communication at sea in situations involving safety of life at sea and navigational safety, especially when language difficulties arise between ships or stations of different nationalities. The Code is suitable for transmission by all means of communication, including radiotelephony, radiotelegraphy, sound, flashing light, and flags.

Pub. 117. Radio Navigational Aids. A publication of the Defense Mapping Agency Hydrographic/Topographic Center which contains data on radio aids to navigation services provided to mariners. Information on radio direction finder and radar stations, radio time signals, radio navigational warnings, distress signals, stations transmitting medical advice, long range radionavigation systems, emergency procedures and communications instructions, listed in text and tabular format.

Pub. 150. World Port Index. A publication of the Defense Mapping Agency Hydrographic/Topographic Center listing the location, characteristics, known facilities, and available services of ports, shipping facilities and oil terminals throughout the world. The applicable chart and Sailing Direction volume is given for each place listed. A code indicates certain types of information.

Pub. 151. Distances Between Ports. A publication of the Defense Mapping Agency Hydrographic/Topographic Center providing calculated distances in nautical miles over water areas between most of the seaports of the world. A similar publication published by the National Ocean Service of United States waters is entitled *Distances between United States Ports*.

Pub. 217. Maneuvering Board Manual. A publication of the Defense Mapping Agency Hydrographic/Topographic Center providing explanations and examples of various problems involved in maneuvering and in relative movement.

Pub. 221. Loran C Table. A series of tables published by the Defense Mapping Agency Hydrographic/Topographic Center, published primarily for manufacturers who use computers to correct Loran C time differences to geographic coordinates. The tables also correct time differences for ASF.

Pub. 224. Omega Tables. A series of tables published by the Defense Mapping Agency Hydrographic/Topographic Center providing the tabular counterpart of the Omega chart. With the appropriate charting coordinate or lattice table, Omega lines of position can be plotted on suitable a plotting sheet or chart having a scale large as 1:800,000. 2. *Omega Propagation Correction Tables*; a series of tables published by the Defense Mapping Agency Hydrographic/Topographic Center providing necessary data for correcting Omega Navigation System receiver readouts affected by the prevailing propagation conditions, to the standard conditions on which all Omega hyperbolic charts and lattice tables are based.

Pub. No. 226. Handbook of Magnetic Compass Adjustment. A publication of the Defense Mapping Agency Hydrographic/Topographic Center, providing information for adjustment of marine magnetic compasses.

Pub. No. 229. Sight Reduction Tables for Marine Navigation. A publication of the Defense Mapping Agency Hydrographic/Topographic Center, in six volumes each of which includes two 8° zones of latitude. An overlap of 1° of latitude occurs between volumes. The six volumes cover latitude bands 0°-15°, 15°-30°, 30°-45°, 45°-60°, 60°-75°, and 75°-90°. For entering arguments of integral degrees of latitude, declination, and local hour angle, altitudes and their differences are tabulated to the nearest tenth of a minute, azimuth angles to the nearest tenth of a degree. The tables are designed for precise interpolation of altitude for declination only by means of interpolation tables which facilitate linear interpolation and provide additionally for the effect of second differences. The data are applicable to the solutions of sights of all celestial bodies; there are no limiting values of altitude, latitude, hour angle, or declination.

Pub. No. 249. Sight Reduction Tables for Air Navigation. A publication of the Defense Mapping Agency Hydrographic/Topographic Center, in three volumes, with volume 1 containing tabulated altitudes and azimuths of selected stars, the entering arguments being latitude, local hour angle of the vernal equinox, and the name of the star; and volumes 2 and 3 containing tabulated altitudes and azimuth angles of any body within the limits of the entering arguments, which are latitude, local hour angle, and declination (0°-29°) of the body.

Pub. 1310. Radar Navigation Manual. A publication of the Defense Mapping Agency Hydrographic/Topographic Center which explains the fundamentals of shipboard radar, radar operation collision avoidance, radar navigation, and radar-assisted vessel traffic systems in the U.S.

puddles *n.* An accumulation of melt-water on ice, mainly due to melting snow, but in the more advanced stages also due to the melting of ice.

pulse, *n*. A short burst of electromagnetic energy, such as emitted by a radar.

pulse decay time. The interval of time required for the trailing edge of a pulse to decay from 90 percent to 10 percent of the pulse amplitude.

pulse duration. The time interval during which the amplitude of a pulse is at or greater than a specified value, usually stated in terms of a fraction or percentage of the maximum value.

pulse duration error. A range distortion of a radar return caused by the duration of the pulse. See also SPOT-SIZE ERROR.

pulse group. See PULSE TRAIN.

pulse interval. See PULSE SPACING.

pulse length. See PULSE DURATION.

pulse-modulated radar. The type of radar generally used for shipboard navigational applications. The radio-frequency energy transmitted by a pulse-modulated radar consists of a series of equally spaced short pulses having a pulse duration of about 1 microsecond or less. The distance to the target is determined by measuring the transmit time of a pulse and its return to the source as a reflected echo. Also called PULSE RADAR.

pulse modulation. 1. The modulation of a carrier wave by a pulse train. In this sense, the term describes the process of generating carrier-frequency pulses. 2. The modulation of one or more characteristics of a pulse carrier. In this sense, the term describes methods of transmitting information on a pulse carrier.

pulse radar. See PULSE-MODULATED RADAR.

pulse repetition frequency. The pulse repetition rate of a periodic pulse train.

pulse repetition rate. The average number pulses per unit of time. See also PULSE REPETITION FREQUENCY.

pulse rise time. The interval of time required for the leading edge of a pulse to rise from 10 to 90 percent of the pulse amplitude.

pulse spacing. The interval between corresponding points on consecutive pulses. Also called PULSE INTERVAL.

pulse train. A series of pulses of similar characteristics. Also called PULSE GROUP, IMPULSE TRAIN.

pulse width. See PULSE DURATION.

pumice, *n.* Cooled volcanic glass with a great number of minute cavities caused by the expulsion of water vapor at high temperature, resulting in a very light rocky material.

pumping, *n.* Unsteadiness of the mercury in a barometer, caused by fluctuations of the air pressure produced by a gusty wind or due to the motion of a vessel.

pure sound. See PURE TONE.

pure tone. A sound produced by a sinusoidal acoustic oscillation. Also called PURE SOUND.

purple light. The faint purple glow observed on clear days over a large region of the western sky after sunset and over the eastern sky before sunrise.

put to sea. To leave a sheltered area and head out to sea.

pyramidal iceberg. See PINNACLED ICEBERG.