



Academic Press Dictionary of Science and Technology

Edited by
Christopher Morris



Academic Press

Harcourt Brace Jovanovich, Publishers

San Diego New York Boston London Sydney Tokyo Toronto

This book is printed on acid-free paper. (∞)

Copyright © 1992 by ACADEMIC PRESS, INC.

All Rights Reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher.

Academic Press, Inc.

1250 Sixth Avenue, San Diego, California 92101-4311

United Kingdom Edition published by

Academic Press Limited

24-28 Oval Road, London NW1 7DX

Library of Congress Cataloging-in-Publication Data

Academic Press dictionary of science and technology / edited by

Christopher Morris

p. cm.

ISBN 0-12-200400-0

1. Science--Dictionaries. 2. Technology--Dictionaries.

I. Morris, Christopher G. II. Academic Press. III. Title:

Dictionary of science and technology.

Q123.A33 1991

503--dc20

90-29032

CIP

PRINTED IN THE UNITED STATES OF AMERICA

92 93 94 95 96 97 DO 9 8 7 6 5 4 3 2 1

uniform topology *Mathematics.* given a uniformity F on a topological space X , the topology whose open sets are the subsets U of X with the property that there is a set V in F such that the set $\{y : (x, y) \in V \text{ for some } x \in U\}$ is a subset of U . If a uniform topology exists for X , then X is said to be a *uniform space*.

unijunction transistor *Electronics.* a three-terminal transistor containing an emitter and two bases, and possessing negative-resistance characteristics; used mainly in switching circuits.

unilateral *Science.* of or relating to only one side.

unilateral anesthesia see HEMI-ANESTHESIA.

unilateral conductivity *Electronics.* the theoretical property of a circuit element to conduct electrical current in one direction only; in practice, even the best diode allows some reverse current to flow.

unilateral hermaphroditism *Zoology.* the presence of gonadal tissue typical of both sexes on one side, and of an ovary or testis on the other.

unilateralization *Electronics.* a technique similar to neutralization in which both the resistive and reactive components of feedback in a device are completely neutralized by external feedback to prevent undesired oscillations; the result is a device that effectively has no feedback.

unilateral surface *Mathematics.* a nonorientable two-dimensional manifold (e.g., the Möbius strip or Klein bottle) that has only one side.

unilateral tolerance method *Design Engineering.* a tolerance methodology applied to dimensioning where the tolerance is either a plus or a minus from the stated dimension; the dimension is the size or location nearest the critical condition of the material and the tolerance is either a plus or minus, whichever allows variation away from the critical point.

unilateral transducer see UNIDIRECTIONAL TRANSDUCER.

unilineal descent *Anthropology.* a practice in which one is related through a group of kin solely on the basis of one sex or the other.

unilinear cultural evolution see CULTURAL EVOLUTION.

unilugate *Botany.* of a pinnacle leaf, having only one pair of leaflets.

unimodular matrix *Mathematics.* a square matrix with determinant 1.

unimolecular *Physical Chemistry.* involving only a single molecule, rather than interaction between two separate molecules. Thus, **unimolecular reaction**.

unineme hypothesis *Molecular Biology.* a theory stating that a chromatid has only a single DNA duplex, which reaches from one end of the chromatid to the other.

uninhibited neurogenic bladder *Medicine.* a dysfunction of the bladder due to a lesion in the region of the upper motor neurons, marked by urgency and frequent involuntary voiding.

unintentional radiation exploitation *Military Science.* the operational use of non-information-bearing elements of electromagnetic energy unintentionally emanated by targets of interest.

uninterruptible power system *Electricity.* a power system that provides protection against primary power failure and variations in power-line frequency and voltage; commonly consists of a storage battery, battery charger, solid-state inverter, and solid-state switching circuit, as applied in computer systems; it may be used on-line between power line and load to provide voltage regulation and suppressed transients, or off-line and switched in only when utility power fails. Also, **uninterruptible power source** or **supply**.

union the process of uniting, or something that unites; specific uses include: *Surgery.* the process of healing; the adhesion or joining of structures or tissues, such as the edges of a wound or interfaces of a fractured bone. *Mechanical Devices.* any of a number of devices used to connect machine pipes and other parts. *Design Engineering.* a flanged or screwed pipe coupling around the outside of a joint, usually in the form of a ring fitting. *Computer Programming.* 1. the logical OR of two propositions resulting in a True value if one of the propositions is True. 2. the joining of two or more files or other objects. 3. a set union formed from two sets of data. *Mathematics.* 1. a binary set operation; denoted \cup and read "union," "join," or "cup." The union $A \cup B$ of two sets A and B is the set of all objects that are elements of at least one of A and B . 2. the union U of a collection $\{X_\alpha\}$ of sets is the set having the following properties: (a) if x is an element of X_α for some α , then x is an element of U ; and (b) if x is an element of U , then x is an element of X_α for some α . Also called a *join* or *sum*; often denoted $\cup_\alpha X_\alpha$, or similar notation. 3. the union $U = G_1 \cup G_2$ of two graphs G_1 and G_2 is a graph with $V(U) = V(G_1) \cup V(G_2)$ such that two vertices are joined by an edge in at least one G_i .

union fabric *Textiles.* a fabric made from more than one fiber type, especially fabric made with a cotton warp and a wool filling.

Unionidae *Invertebrate Zoology.* a large family of freshwater mussels, bivalve mollusks in the subclass Eulamellibranchia; the outer shell surface is rough and brown or black; the inner surface is pearly and used for buttons; larvae are fish ectoparasites.

union joint *Mechanical Devices.* a threaded-pipe coupling used to connect two threaded pipes, which allows for disconnection without the need to rotate other pipe lengths.

union of languages *Computer Science.* a language whose sentences are members of any of its component languages.

unipara *Medicine.* a female who has had one pregnancy that resulted in a viable fetus, regardless of whether the infant was alive at birth, and regardless of whether it was a single or multiple birth.

uniparental inheritance *Genetics.* a form of inheritance in which the offspring possess the phenotype of only one parent.

unipolar *Electricity.* having a single pole or polarity or direction. *Anatomy.* of a nerve cell or other structure, having but a single pole or process. *Psychology.* describing a mood disorder in which only depressive episodes occur.

Unipolarina *Invertebrate Zoology.* a suborder of parasitic sporozoan protozoans in the order Myxosporidia.

unipolar transistor *Electronics.* 1. a transistor in which the main conduction path is through P-type or N-type material, but not both, and charge carriers are of only one polarity. 2. see FIELD-EFFECT TRANSISTOR.

unipolar transmission see NEUTRAL TRANSMISSION.

unipole *Electromagnetism.* a hypothetical antenna that receives or transmits uniformly in all directions.

uniport *Biochemistry.* the transmembrane movement of one kind of solute by a carrier not linked to another solute transport across the same membrane.

unipotency *Developmental Biology.* the ability of a part to develop in one manner only. *Cell Biology.* the ability of a cell to develop into just one type of cell. Thus, **unipotent**, **unipotential**.

unipotential cathode see INDIRECTLY HEATED CATHODE.

unipotential electrostatic lens *Electronics.* an electrostatic lens having three apertures, with the same voltage difference between the central aperture and each of the outer apertures.

unique DNA *Molecular Biology.* any sequence of nucleotides in DNA that occurs only one time in a genome.

unique factorization domain *Mathematics.* an integral domain in which: (a) every nonzero nonunit element can be written as the product of a finite number of irreducible elements or factors; (b) any two such factorizations are composed of exactly the same number of factors; and (c) the factors in any factorization can be permuted so that corresponding factors are associates of one another.

unique factorization theorem *Mathematics.* a theorem stating that any positive integer can be factored in exactly one way; follows from the fact that the integers form a unique factorization domain.

uniserial *Biology.* arranged in a single row or a series of rows along only one side of an axis.

uniserrate *Biology.* having one row of serrations on a single edge.

unisexual *Biology.* having the reproductive organs and capabilities of one sex only; male or female rather than hermaphroditic.

unit *Physics.* 1. a quantity that is used and referred to as an accepted standard. 2. relating to the quantity of one. 3. any type of quantity that qualifies a physical measurement, such as a velocity measurement, which may be qualified by cm/sec, km/hr, and so on. *Engineering.* any device that can operate independently, such as a radio receiver or an oscilloscope. *Military Science.* 1. any military organization that is structured according to competent authority, especially one that is part of a larger organization. 2. the organizational title of a subdivision of a task force group. *Industrial Engineering.* see UNIT OF ISSUE. *Mathematics.* 1. the multiplicative identity of a ring, field, etc. The phrases "ring with unit" or "ring with identity" are commonly used. Also, **unit element**, **unity**. 2. an element of a ring that has both a left and right multiplicative inverse. 3. having length or norm equal to 1. For example, a **unit vector** is a vector of length one. A **unit binormal** (normal, tangent) is a unit vector in the same direction as a given binormal (resp. normal, tangent) vector. The **unit interval** is the interval (0, 1) or [0, 1]. 4. centered at the origin and having radius 1. For example, the **unit circle** and **unit n-sphere** are the circle of radius 1 and the sphere of radius 1 centered at