On Greek Loanwords in the English Vocabulary of Hydrology
(A Lexicological Approach)

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Abstract
Owing to migration, ease of travel, mass communication, and similar factors – among which science and technique are the most important – words of foreign origin – and particularly Greek ones – abound in present-day English speech and writing, including the language of hydrology. These words are either totally assimilated, or they may retain traces of their foreign origin, or they remain semantically tied to the Greek context, or they are context-limited. Well understanding them can only ease communication in the field of hydrology particularly if we take into account the fact that accessing the EU also asks for adaptation to EU standards in nomenclature.

Key words: Greek loanwords, English, hydrology vocabulary

Introduction
There are, in English, two series of words containing the element hydr(a/o)-, but having two different meanings, as follows: hydr(a/o)-1 ‘a combining form meaning “water”, used in the formation of compound words: hydroplane, hydrogen’, and hydr(a/o)-2 ‘a combining form representing hydrogen in compound words, denoting especially a combination of hydrogen with some negative element or radical: hydrobromic’.

In everything that follows, we have taken into account only the first series, the only one related directly to ‘water’ and, more or less directly, to the field of hydrology.

Material and Method
We have inventoried, with the help of language dictionaries and of literature, a number of 195 words with hydr(a/o)-. Some of these words containing hydr(a/o)- are loanwords, some are compound, and some are derived. We used the statistical method to calculate the share of each of these categories of words, in our quest for a method of making this vocabulary easier to understand and to learn by any (future) specialist involved in the study of hydrology.

Results and Discussion
1. Loanwords
A loanword (also loan word or loan) is ‘a word in one language that has been borrowed from another language and usually naturalised, as wine taken into Old English from Latin vinum, or macho, taken into Modern English from Spanish’.

There are 23 loanwords in our corpus.

1.1. Nouns. There are 21 borrowed nouns: 18 nouns are borrowed from Greek through Latin: hydra ‘Class. Myth. a water or marsh serpent with nine heads, each of which, if cut off, grew back as two: Hercules killed this serpent by cauterising the necks as he cut off the heads; any freshwater polyp or the genus Hydra and related genera, having a cylindrical body with a ring of tentacles surrounding the mouth, and usually living attached to rocks, plants, etc., but also capable of detaching and floating in the water; a persistent or many-sided problem that presents new obstacles as soon as one aspect is solved; Astron. the Sea Serpent, a large southern constellation extending through 90° of the sky, being the longest of the constellations’, hydrangea ‘any shrub belonging to the genus Hydrangea, of the saxifrage family, several species of which are cultivated for their large, showy flower clusters of white, pink, or blue colour’, hydrargyrum ‘mercury’, hydrastis ‘goldenseal’, hydralus ‘a pipe organ of ancient Greece and Rome using water pressure to maintain the air supply’, hydrilla ‘a submerged aquatic plant, Hydrilla verticillata, native to the Old World, that has become a pest weed in U.S. lakes and waterways’, hydroa ‘Pathol. any skin condition characterized by red vesicular areas’, hydrocephalus ‘Pathol. an accumulation of serous fluid within the cranium, especially in infancy, due to obstruction of the movement of cerebrospinal fluid, often causing great enlargement of the head; water on the brain’, hydrocephaly ‘hydrocephalus’, hydrocoral ‘any colonial marine animal of the hydrozoan order Stylasterina having a calcareous skeleton resembling that of the true corals’, hydromedusa ‘the medusa form of a hydrozoan’, hydromel ‘a liquor consisting of honey and water
that, when fermented, becomes mead’, hydrops(y) ‘Pathol. oedema’, hydrosoma ‘Zool. hydroscope’, hydrotheca ‘Zool. the part of the perisarc covering a hydrant’, hydrotherapy ‘the branch of therapeutics that deals with the curative use of water; the treatment of physical disablement, injury, or illness by immersion of all or part of the body into water to facilitate movement, promote wound healing, relieve pain, etc., usually under the supervision of a trained therapist’, hydrozoan ‘any freshwater or marine coelenterate of the class Hydrozoa, including free-swimming or attached types, as the hydra, in which one developmental stage, either the polyp or medusa, is absent, and colonial types, as the Portuguese man-of-war, in which both medusa and polyp stages are present in a single colony’, Hydrus ‘the Water Snake, a southern constellation between Eridanus and Octans’, and 3 are borrowed from Greek through French: hydrogen ‘a colourless, odourless, flammable gas that combines chemically with oxygen to form water’ (hydrogen bond / bond / bromide / chloride / cyanide / fluoride / fluoride / iodide / ion / peroxide / sulphide), hydrargyria(sis) ‘hydrargyrism’, and hydromancy ‘divination by means of the motions or appearance of water’.

1.2. Adjectives. There are 2 adjectives borrowed from Greek through Latin: hydroagogue ‘causing the discharge of water fluid, as from the bowels; Pharm. a hydroagogue agent’ and hydrozoan ‘belonging or pertaining to the Hydrozoa’.

2. Compounds

A compound is ‘a word consisting of two or more parts that have identifiable meaning, as a base and a non-proof-suffix (return, follower), a base and a combining form (biochemistry), two combining forms (ethno-graphy), or a combining form and a non-proof-affix (aviary, dentoid)’. There are in all 72 compounds in our corpus.

2.1. Nouns. There are 57 compound nouns in our corpus. They are of only two types: 1st the Greek combining forms hydr(a/o)-/-lysis + a(n) (English / Greek) base (36); - the Greek combining form hydr(a/o)- + an English base (30 + 4): hydragilite ‘Mineral. gibbsite’, hydroaerobics ‘aerobic exercises performed in water, as in a swimming pool’, hydroairplane ‘a hydroplane’, hydrobiology ‘the study of aquatic biology’, hydrobomb ‘an aerial torpedo equipped with a rocket engine that propels it after the torpedo has entered the water’, hydrocellulose ‘a gelatinous substance obtained by the partial hydrolysis of cellulose, used chiefly in the manufacture of paper, mercerized cotton, and viscose rayon’, hydrocolloid ‘a substance that forms a colloid when combined with water’, hydrodynamics ‘the branch of fluid dynamics that deals with liquids, including hydrostatics and hydrodynamics; hydromechanics’, hydrofoil ‘Naval Archit. a surface from creating a thrust against water in a direction perpendicular to the plane approximated by the surface; Naut. a wing-like member having this form, designed to lift the hull of a moving vessel; a vessel equipped with hydrofoils, hydrogel ‘a gel whose liquid constituent is water’, hydrogeology ‘the science dealing with the occurrence and distribution of underground water; hydrology, geohydrology’, hydromagnetics ‘magnetohydrodynamics’, hydromechanics ‘hydrodynamics’, hydrometallurgy ‘the technique or process of extracting metals at ordinary temperatures by leaching ore with liquid solvents’, hydrometeor ‘liquid water or ice in the atmosphere in various forms, as rain, ice crystals, hail, fog, or clouds’, hydrometeorology ‘the study of atmospheric water, especially precipitation, as it affects agriculture, water supply, flood control, power generation, etc.’, hydrometer ‘an instrument for determining the specific gravity of a liquid, commonly consisting of a graduated tube weighted to float upright in the liquid whose specific gravity is being measured’, hydronephrosis ‘Pathol. dilation of the branches and pelvic cavity of the kidney, caused by an accumulation of urine resulting from obstruction of normal outflow’, hydropian ‘a seaplane, an attachment to an airplane enabling it to glide on the water, a light high-powered boat especially one with hydrofoils or a stepped bottom designed to plane along the surface of the water at very high speeds, a horizontal rudder for submerging or elevating a submarine’, hydropower ‘hydric power, hydroquinol ‘hydroquinone’, hydroquinone ‘Chem. a white, crystalline compound, C6H4O2, formed by the reduction of the quinine: used chiefly in photography and to inhibit autoxidation reactions’, hydrosere ‘Ecol. a sere originating in water’, hydroski ‘a hydrofoil attached to a seaplane to aid in takeoffs and landings’, hydrosol ‘Physical Chem. a colloidal suspension in water’, hydrosphere ‘the water on or surrounding the surface of the globe, including the water of the oceans and the water in the atmosphere’, hydrotherapeutics ‘hydrotherapy’, hydrothorax ‘Pathol. the presence of serous fluid in one or both pleural cavities’, hydrotopism ‘Biol. oriented growth in response to water’, and hydrozincite ‘Mineral. a hydrous zinc carbonate, Zn5(CO3)2(OH)6, an important ore of zinc in some localities’ + another 4 compounds of the same type in which the English base is represented by a fragment of word: hydroponics ‘the cultivation of plants by placing the roots in liquid nutrient solutions rather than in soil; soil-less growth of plants’, HYDROLANT ‘an urgent warning of navigational dangers in the Atlantic Ocean, issued by the U.S. Navy Hydrographic Office’, hydronaut ‘a person trained to
work in deep-sea vessels for research and rescue purposes’, and HYDROPAC ‘an urgent warning of navigational dangers in the Pacific Ocean, issued by the U.S. Navy Hydrographic Office’;
- the Greek combining form hydr(a/o)- + a Greek base (1): hydranth ‘Zool. the terminal part of a hydroid polyp that bears the mouth and tentacles and contains the stomach region’; and
- an English base + the Greek combining form –lysis (1): hydrogenolysis ‘decomposition of a compound resulting from its interaction with hydrogen’,

2nd two (Greek / English/Greek/Latin) combining forms (21):
- the Greek combining form hydr(a/o)- + another Greek combining form(15): hydr(a)emia ‘Med. the state of having an excess of water in the blood’, hydrocele ‘an accumulation of serous fluid, usually about the testis’, hydrograph ‘a graph of the water level or rate of flow of a body of water as a function of time, showing the seasonal change’, hydrography ‘the science of the measurement, description, and mapping of the surface waters of the earth, with special reference to their use for navigation; those parts of a map, collectively, that represent surface waters’, hydrolysis ‘chemical decomposition in which a compound is split into other compounds by reacting with water’, hydrolyte ‘a substance subjected to hydrolysis’. hydrometry, hydrography ‘the curing of disease by the internal and external use of water’, hydrophane ‘a partly translucent variety of opal, which becomes more translucent when immersed in water’, hydrophilic, hydrophobe ‘Chem. a hydrophobic substance’, hydrophone ‘a device for locating sources of sound under water, as for detecting submarines by the noise of their engines; an instrument employing the principles of the microphone, used to detect the flow of water through a pipe; Med. an instrument used in auscultation, whereby sounds are intensified through a column of water’, hydrophyte ‘a plant that grows in water or very moist ground; an aquatic plant’, hydrosome ‘Zool. the entire body of a compound hydrozoan’, and hydrostat ‘an electrical device for detecting the presence of water, as from overflow or leakage; any of various devices for preventing injury to a steam boiler when its water sinks below a certain level’;
- the Greek combining form hydr(a/o)- + a Latin combining form (4): hydrophobia ‘rabies; an abnormal or unnatural dread of water’, hydrostatics, hydrothermal ‘the science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere; hydrogeology, geochemistry’ and hydrograph: The reverse is rather scarce, as there are only 3 shortenings of compounds – 2 nouns: hydro ‘Informal. hydroelectric power; Informal. hydroplane; Brit. a bathhouse, hotel, or resort catering to people taking mineral-water health cures, spa; an establishment furnishing hydrotherapy’ and hydros. ‘hydrostatics’, and 1 adjective: hydro ‘Informal. of, pertaining to, or furnishing water, water power, or hydroelectricity’.

2.2. Adjectives. There are in all 11 combined adjectives in our corpus. They are of the following types:

1st the Greek combining form hydr(a/o)- + an English base (4): hydrodynamic ‘pertaining to forces in or motions of liquids; of or pertaining to hydrodynamics’, hydroelectric ‘pertaining to the generation and distribution of electricity derived from the energy of falling water or any other hydraulic source’, hydrostatic, and hydrothermal ‘Geol. noting or pertaining to the action of hot, aqueous solutions or gases within or on the surface of the earth (hydrothermal vent);

2nd two combining forms (Greek / English/Greek/Latin) (7):
- the Greek combining form hydr(a/o)- + another Greek combining form (3): hydrarch ‘originating in a wet habitat’, hydrolytic ‘producing, noting, or resulting in hydrolysis’, and hydrophilic ‘of or pertaining to a heating system for a building in which the medium for carrying heat throughout the structure is circulating water, especially when the circulation is aided by a pump’;
- the Greek combining form hydr(a/o)- + an English combining form (3): hydrotropic ‘Biol. turning or tending in a particular direction with reference to moisture’, hydromorphic ‘of or pertaining to soil having characteristics that are developed when there is excess water all or part of the time’, and hydrophilic ‘having a strong affinity for water’;
- the Greek combining form hydr(a/o)- + Latin combining form (1): hydrophilous ‘pollinated by the agency of water; hydrophytic’.

2.3. Verbs. There are in all 4 combined verbs. They are of the following type:

1st the Greek combining form hydr(a/o)- + an English base (3): hydromulch ‘to spread mulch on (a field, garden, etc.) in a stream of water propelled through a hose’, hydroplane ‘to skim over water in the manner of a hydroplane, to travel in a hydroplane, to ride on a film of water on a wet surface with a resulting decrease in braking and steering effectiveness’, and hydroseed ‘to sow (a field, lawn, etc.) with seed by distribution in a stream of water propelled through a hose’.
2 Greek combining forms (Greek / Greek) (1):
- the Greek combining form hyd(a/o)- + another Greek combining form(3): hydrolyse 'to subject or be subjected to hydrolysis'.

3. Derivatives
A derivative (also derived form) is 'a form that has undergone derivation from another, as atomic from atom'.

There are in all 93 derivatives in our corpus.

3.1. Nouns. There are 37 derived nouns in our corpus.

Thus, there are 9 nouns ending in –ist 'a suffix of nouns that denote a person who practices or is concerned with something, or holds certain principles, doctrines, etc.': hydrobiologist, hydrodynamicist 'a specialist in hydrodynamics', hydrogeologist, hydrologist, hydrolyst 'hydrolyse', hydrometeorologist, hydropathist, hydropon(yc)ist, and hydrotherapist; 3 nouns ending in –er 'a suffix used in forming nouns designating persons from the object of their occupation or labour, or from their place of origin or abode, or designating either persons or things from some special characteristic or circumstance: hydrographer, hydrolyser, and hydroplaner 'a person who pilots a hydroplane, especially a professional speedboat racer'; 3 nouns ending in –ics 'a suffix of nouns that denote a body of facts, knowledge, principles, etc.': hydraulics 'the science that deals with the laws governing water or other liquids in motion and their applications in engineering; practical or applied hydrodynamics', hydrokinetics 'the branch of hydrodynamics that deals with the laws governing liquids or gases in motion', and hydrostatics 'the branch of hydrodynamics that deals with the statics of fluids, usually confined to the equilibrium and pressure of liquids'; 3 nouns ending in –ing 'a suffix of nouns formed from verbs, expressing the action of the verb': hydroaerolimming 'hydraulic mining', hydrocooling 'the process or technique of arresting the ripening of fruits and vegetables after harvesting by immersion in ice water', and hydrofracturing 'a method of increasing the permeability of rock penetrated by an oil or gas well by pumping in water and sand under pressure to open up cracks in the rocks'; 3 nouns ending in –isation 'a combination of –ise and –ation used to form nouns from stems in –ise': hydrogenisation, hydrolysisation, and hydropneumatisation 'utilisation of air pressure in the housing of a water turbine to keep the level of water that has been used from rising to interfere with the rotor blades'; 3 nouns ending in –ity 'a suffix used to form abstract nouns expressing state or condition': hydroelectricity, hydrophobicity, and hydroscopicity, 2 nouns ending in –ase 'a suffix used in the names of enzymes': hydrase 'Biochem. any of the class of enzymes that catalyse the addition of a water molecule into a compound without causing hydrolysis' and hydrolyase 'Biochem. an enzyme that catalyses hydrolysis'; 2 nouns ending in –ate 'a suffix used to indicate a salt of an acid': hydrate 'any of a class of compounds containing chemically combined water' and hydrolysate 'any compound formed by hydrolysis'; 2 nouns ending in –ation 'a combination of –ate and –ion used to form nouns from stems in –ate; on this model, used independently to form stems of other origin': hydration (hydration number) and hydrogenation; 2 nouns ending in –ine 'a noun suffix used particularly in chemical terms, and especially in names of basic substances': hydrastine 'Pharm. an alkaloid, C₂₁H₂₁NO₆, that is extracted from the roots of goldenseal and forms prismatic crystals: used as an astringent and to inhibit uterine bleeding' and hydrastinine 'Pharm. a white, crystalline, poisonous alkaloid, C₁₁H₁₃NO₃, synthesised from hydrastine: used to arrest bleeding, especially in uterus'; 2 nouns ending in –ism 'a suffix used in the formation of nouns denoting state or condition': hydrargyrism 'Pathol. mercurialism' and hydrophytism; 1 noun ending in –ant 'a suffix forming nouns denoting impersonal physical agents': hydrant 'an upright pipe with a spout, nozzle, or other outlet, usually in the street, for drawing water from a main or service pipe, especially for fighting fires; a water faucet'; 1 noun ending in –oid 'a suffix meaning “resembling, “like”: hyroid 'the phase of a hydrozoan coelenterate that consists of polyp forms usually growing as an attached colony'; 1 noun ending in –or 'a suffix forming inanimate agent nouns': hydrator 'something that hydrates; a compartment or drawer, as in a refrigerator, for keeping perishable foods fresh and preventing moisture loss'.

3.2. Adjectives. There are in all 44 derived adjectives, as follows: 17 adjectives ending in –ic 'a suffix forming adjectives from other parts of speech': hydragryric, hydraulic 'operated by, moved by, or employing water or other liquids in motion; operated by the pressure created by forcing water, oil, or another liquid through a comparatively narrow pipe or orifice; of or pertaining to hydraulics; hardening under water, as a cement' (hydraulic accumulator / brake / cement / coupling / fluid / lift / mining / motor / pile / press radius / ram / torque converter), hydremic, hydrobiologic, hydrocephalic 'Pathol. of or pertaining to hydrocephalus', hydrogeologic, hydrographic, hydrologic (hydrologic cycle), hydrometric, hydropathic, hydrophobic 'of or pertaining to hydrophobia; Chem. having little or no affinity for water', hydrophytic, hydroptic, hydroptic, hydroscopic, hydrotactic, and hydrothoracic; 16 adjectives ending in –ical 'a combination of –ic and –al, used in forming adjectives from nouns,
and providing an adjective with additional meanings to those in –ic form: hydrobiological, hydrocolloidal, hydrogeological, hydrographical, hydrokinetical ‘pertaining to the motion of liquids; of or pertaining to hydrokinetics’, hydrological, hydromechanical, hydrometallurgical, hydrometeorical, hydropathical, hydrophilical, hydroscopical, hydrostatical ‘of or pertaining to hydrostatics’, and hydrothecal; 5 adjectives ending in –ous ‘a suffix forming adjectives that have the general sense “possessing, full of” a given quality: hydrocephalous ‘hydrocephalic’, hydrogenous, hydrophanous, hydrophyllaceous ‘belonging to the Hydrophyllaceae, the waterleaf family of plants’, and hydrous ‘containing water; Chem. containing water or its elements in some kind of union, as in hydrates or hydroxides’; 2 adjectives ending in –ed, once as ‘a suffix forming the past participle of weak verbs: hydrated chemically combined with water in its molecular form (hydrated alumina / lime); (of paper pulp) beaten until gelatinous for making into water-resistant paper’, and once as ‘a suffix forming adjectives from nouns: hydraheaded containing many problems, difficulties, or obstacles; having many branches, divisions, facets, etc.’; 2 adjectives ending in –oid ‘a suffix meaning “resembling”, “like”: hydrocephaloid ‘Pathol. resembling hydrocephalus’ and hydroid ‘noting or pertaining to that form of hydrozoan that is asexual and grows into branching colonies by budding’; 1 adjective ending in –able ‘a suffix meaning “capable of, susceptible of, fit for, tending to, given to”: hydrolysable; and 1 adjective ending in –an ‘a suffix occurring in adjectives formed from various kinds of noun bases: hydromedusan.

As for the reverse phenomenon, there are surprisingly 4 shortenings: hydrokinetic ‘pertaining to the motion of liquids; of or pertaining to hydrokinetics’, hydroponic, hydrostatic ‘of or pertaining to hydrostatics’, and hydrotherapeutic.

3.3. Adverbs. There are in all 9 adverbs ending in –ly ‘a suffix forming adverbs from adjectives’ in our corpus: hydraulically, hydrobiologically, hydrodynamically, hydrographically, hydrologically, hydrodynamically, hydroponically, hydrostatically, and hydrothermally.

3.4. Verbs. There are 3 derived verbs in our corpus: 2 end in –ate ‘a verbal suffix: hydrate to combine chemically with water’ and hydrogenate to combine or treat with hydrogen, especially to add hydrogen to the molecule of (an unsaturated organic compound); and 1 ends in –ise ‘a verb-forming suffix denoting a change of state: hydrogenise to hydrogenate’.

Conclusions
The loanwords, compounds, and derivatives above belong to a very wide range of fields: anatomy, astronomy, biology, botany, chemistry, cookery, ecology, energy, geography, medicine, metallurgy, meteorology, mineralogy, music, mythology, nautical, naval architecture, navigation, pathology (15!!!), pharmacy, photography, physical chemistry, religion, technique, weaponry, but only compound forms of the hydr(a/o)- + Greek element form refer to hydrology.

If borrowing is an external means of enriching a language, both composition and derivation are internal ones. A language cannot enrich its vocabulary unless the forms involved in the enriching process are felt as its own.
Of the 23 loanwords with hydr(a/o)-, 21 are borrowings from ancient Greek that have come in English through Latin (i.e. they are not direct Greek loans, but late Latin loans) and originating in learned contexts.
The large number of compounds with hydr(a/o)- (more than one third of the total number of compounds) show that this combining form has become in time a very producing one.
As for the very large number of derivatives with hydr(a/o)-, they show that this combining form has ‘made itself at home’ within English, which it enriched very much.

**Literature**


1.2. The word Unlike lexicology, the word has not been given very clear definitions, the lack of clarity being due to the multitude of angles from which it has been approached. Things have got more and more complicated since Bloomfield suggested in 1926 that the word is a minimum free form, meaning that it is the smallest meaningful linguistic unit that can be used independently to convey meaning. There is a degree of flexibility in the way words are written down. Being or not being separated by a space may in itself not be a sure sign of words status.

INTRODUCTION

English Lexicology Test Book is written for undergraduate and postgraduate students, specialists in linguistic theory and practice, and teachers of English. The material for the book is carefully chosen from classical and contemporary British and American sources to meet the particular needs of students majoring in English linguistics. Become well-versed in the fundamentals and particulars of English lexicology, but you will also learn hundreds of new words and their usage. Final test results can help you determine your proficiency in English Lexicology. E.g., Green Beret (U.S.), the City (Brit.)

A loanword (also loan word or loan-word) is a word adopted from one language (the donor language) and incorporated into another language without translation. This is in contrast to cognates, which are words in two or more languages that are similar because they share an etymological origin, and calques, which involve translation. A loanword is distinguished from a calque (or loan translation), which is a word or phrase whose meaning or idiom is adopted from another language by word-for-word