In reviewing the characters of the dominant species of oysters throughout the world it has been shown that two distinct types may be recognized. Type I consists at present of *O. virginica-elongata,* the American and Canadian oyster; *O. angulata,* the Portuguese oyster; *O. cucullata,* an oyster of world-wide distribution in tropical and subtropical regions.

Type II consists at present of *O. edulis,* the European oyster; *O. lurida,* the British Columbian oyster; *O. angasi,* the south Australian mud-oyster.

The oysters of Type I flourish in tropical or subtropical regions; have small eggs, which are thrown directly into the water, and are either male or female.

The oysters of Type II, on the other hand, flourish in temperate regions; have large eggs, which are incubated inside the shell until developed into a free-swimming larva, and the individuals are hermaphrodite.

Now the oysters of Type II occur, in the northern hemisphere, on the west coast of Europe and the west coast of North America, but not on the Atlantic coast of North America. In the southern hemisphere this type occurs in the south of Australia and the south of New Zealand. Why, then, is a dominant member of this type absent from the Atlantic coast of America?[2] It seems highly improbable that there can be any other answer to this question than could be supplied by geological changes, if sufficient knowledge were available. There is every reason to believe that the biological conditions in the estuaries in the middle part of the Atlantic coast of North America would be eminently favorable to the European oyster. The reverse of this has been proved[3] in the case of the American slipper-limpet, which was introduced on American oysters into the Thames estuary in England and has flourished there exceedingly well. It is equally probable that both the European and British Columbian oysters would also thrive on the Atlantic coast, and quite probably increase at a great rate on the warmer beds.

In these days of rapid transport it should be possible to relay oysters from Europe or British Columbia to the American or Canadian Atlantic beds within a few days and with no greater mortality than occurs on relaying from one European bed to another. Any scheme of transplanting, however, ought to be well thought out and should aim at relaying a maximum number of individuals in a small area in secluded estuaries where there is a minimum tidal current.

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[2] J. S. Gutsell in SCIENCE, LXIV, No. 1662, 1926, describes a small species of this type from Beaufort, N. C.

[3] J. H. Orton, *Proc. Roy. Soc.*, B, Vol. 81, 1909.

THE BOILING-POINT AND THE LATENT HEAT OF VAPORIZATION OF WATER

THE teaching of loose concepts in physics in the high schools and colleges may lead to the acquisition of incorrect habits of thinking. Many text-books of physics leave the student with the impression that the boiling-point and latent heat of vaporization of water are immutable constants. The concept of the boiling-point of water being 100° C. is drilled so deeply in the mind of the student that it becomes exceedingly difficult later to uproot this idea. Invariably, when the boiling-point of water is mentioned, the student thinks of 100° C. or 212° F. and a latent heat of 540 calories per gram; that water exists as such only below 100° C., and only as steam above this temperature. Neither is it sufficiently impressed on the student that the latent heat of vaporization is not a constant, but a variable which is a function of the vaporization temperature.

Illustrative of the looseness found in the statement of calorimetric problems is the following one taken from a standard text-book. "How much steam at 150° C. must be added to 1 kg of ice at −10° C. to give nothing but water at 0° C.?" Since no pressure is stated, presumably the student is to assume a boiling-point of 100° C.

Another well-known text-book makes the following statement in explaining the determination of the latent heat of vaporization of water: "In condensing, its latent heat of vaporization is given up and the condensed water is cooled from 100° to the final temperature of the calorimeter." Apparently the figures 100 represent a sacred number.

In a third text-book it is stated that "brine must be raised above 100° C. to boil." As if pure water can not be made to boil above 100° C. or that it must boil at 100° C.! What must the student think of his physics text-book when he observes water above 100° C. being fed to the boiler of a power-plant?

In a fourth text the author after carefully showing that the boiling-point and latent heat of vaporization are variables rather than constants, then proceeds to give an illustrative problem of an experimental determination of the latent heat of vaporization, and without stating any pressure, tacitly assumes that the boiling-point is 212° F.

In a fifth text the following usual problem is given: "How much heat would be required to change 10 grams of ice at −10° C. to steam at 110°? Assume a specific heat of steam at constant pressure equal to 0.5." To solve this problem the student takes for granted that the boiling-point is 100° C., and that the steam has been heated from 100 to 110. Soon he arrives at such a habit of thinking that no problem in saturated or superheated steam can be solved unless that mystic number 100 is introduced into the problem. It would be very desirable if authors of general physics text-books could be induced to exercise greater care in the treatment and statement of problems in calorimetry.

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CORYNEUM CANKER OF CYPRESS

THE Monterey cypress (*Cupressus macrocarpa*) is widely planted in the warmer temperate parts of Europe, South America, Australia and New Zealand. It has long been a favorite for hedges, windbreaks and for park purposes in the coastal region of its native California, occurring so generally that, like eucalyptus, it has become a characteristic of the landscape. The early California plantings enjoyed comparative freedom from pests and diseases. Then insects gained a foothold, becoming particularly active in trees on unfavorable sites and in the warm, dry interior valleys. Nearer the coast the cypress fared better and, while a gradual increase in damage from insects and root troubles has been noted, the loss among trees under proper care has not been large until the last two or three years, when dying back of specimens of all ages became general around the south half of San Francisco Bay. The injury was first attributed to the attack of bark-beetles, as these insects were commonly present in the dead trees. Mr. J. M. Miller, entomologist, United States Department of Agriculture, in the spring of 1927, reported to this office that he was unable to trace the dying back in certain trees at Palo Alto and Stanford University, California, to insects. From the appearance of the affected parts he was led to believe that a fungous disease might be responsible. The same trouble has since been found to be general in the portions of Alameda, Santa Clara and San Mateo Counties adjacent to San Francisco Bay. It has also been reported from Sacramento County, but is not yet definitely known to occur elsewhere.

Affected trees become conspicuous through the dying of individual parts of the crown, either branches or portions of the top. This continues until finally the entire tree is either killed or is rendered so unsightly that its removal becomes necessary. An inspection shows the dying to be due to the girdling action of bark cankers caused by a fungus. The affected bark first swells and soon begins to die in the central portion of the canker. The dying is accompanied by heavy resin flow, which furnishes one of the most characteristic indications for the presence of the canker. Ordinarily branch cankers are less than a foot in length, but on the main stem they may be longer. A pitch moth commonly works among the resinous material on the diseased bark, giving the appearance at first glance of being connected with the injury. The causal fungus is an apparently undescribed species of Coryneum, the blackish pustules of which usually appear irregularly scattered over the surface of the discolored, dead bark of the cankers. Inoculations on young Monterey cypress with spores of the fungus resulted in positive infections, both on wounded and unwounded young bark and on unwounded foliage. Typical acervuli of the Coryneum developed from a number of the infections. The common avenues of infection in the open have not yet been definitely determined. As control measures the removal of sources of further infection by the cutting-out and destruction of all cankers followed by applications of a standard fungicidal spray are indicated. So far the disease is confined mainly to Monterey cypress, but the well-known Italian cypress (*C. sempervirens*) is also severely attacked and it is not unlikely that other cypress species may be found susceptible.

No clue as to the origin of the disease has been found. To all appearances it has been present in certain of the localities where it is now serious for perhaps four or five years, but beyond that nothing is known. There is no record of any disease resembling it on the native cypresses of the state. Irrespective of its origin the canker has sufficiently demonstrated its destructive possibilities to warrant efforts for the prevention of its spread to localities where it is not now present. Further studies of the disease are under way.

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MORE RESEARCH

SPEAKING of *research:* Ré-search is bad enough, but how about ré-zearch? One hears this occasionally from doctors of philosophy in various sciences. I once knew a minister who used frequently to pray for ré-zawrse, thus perpetrating three distinct errors in one comparatively short word.

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IN reference to the letters as to "The Pronunciation of Research," in SCIENCE for May 4, I think there will be universal agreement that the Oxford Dictionary is the final court of appeal as to spelling and pronunciation of English. That gives the accent on the second syllable of "research" used both as a noun and a verb, and also places the accent on the second syllable in "researcher."

W. H. KUN