published as a confirmation of the results presented by Schumacher and Sprenger.

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MECHANICS OF FLUIDS IN RECENT TEXT-BOOKS OF PHYSICS

EVERY few years it becomes necessary for a teacher of physics to choose a new text-book from the large variety offered by the publishers, or at least to look over the list to see if there is a new one which is more suitable than the one he has been using. If he has plenty of time, he may look carefully through many books; if not, he may, as I have done, choose one subject in the books and compare the authors' treatment of that. It has been my habit to study the chapters having to do with the mechanics of fluids, particularly liquids. Why is it that less care seems to be exercised in writing this part of a physics text than any other?

A quite recent and excellent text has this statement in italics: *"The force which a liquid exerts against any surface is equal to the area of the surface times its average depth times the density of the liquid,"* and later makes use of the formulas: $F = Ahd$ and $p = hd$. As the authors of this text define density in the usual way as the mass per unit volume of a substance, pressure can not be equal to height times density. The dimensions will not agree. The pressure at a given point in a liquid depends not only on the depth and the density but also on the pull which the earth exerts on each unit mass of the liquid, that is, on the value of the acceleration of gravity. $P = hdg$. We may write $P = hd$ if we choose to define density as the weight per unit volume as is sometimes done, but in that case we may not write the formula for the velocity of a compressional wave in an elastic medium in the form $V = \sqrt{\frac{E}{d}}$.

Very few text-books make a complete statement of the principle of buoyancy or Archimedes' principle. The usual statement is that a body wholly or partly immersed in a fluid is buoyed up by a vertical force equal to the weight of the fluid displaced. Is it not important to state that we may consider the center of gravity of the fluid which the body displaces as the point of application of the buoyant force? I find that the average student assumes, often incorrectly, that the buoyant force acts at the center of gravity of the immersed body.

The subject of "The Siphon in Text-books" has been very well discussed by Professor Harold C. Barker in SCIENCE.[1] I can add nothing to that except to call attention to the fact that some of the most recent texts discuss the siphon under the subject "Fluids at Rest" and that a very careful reading of some of them will fail to show even why a siphon starts to operate. No effort is made to show why it continues to operate, or to show that stable operation can take place only when the highest part of the tube is less than barometric height above the *intake and outlet*. If we discuss this with the author, perhaps he will say he considers the subject of fluids in motion and Bernoulli's theorem too difficult for beginning students. Perhaps it is, but it would be better to tell what a siphon does and state its limits of operation without explanation than to give an explanation which pretends to tell the story and does not do so.

[1] 51: 489–491, May 14, 1920.

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PETRIFIED WOOD IN THE NEW ALBANY SHALE

THERE have been frequent references to petrified wood in the black shales of Indiana, Kentucky and Ohio. Silicified tree trunks were reported from the vicinity of Lebanon, Kentucky, at the New Haven meeting of the American Association for the Advancement of Science in 1850. Reports of the state geological survey occasionally mention such wood in Indiana, and in 1914 Elkins and Wieland described an Indiana specimen as *Callixylom Oweni*. Petrified wood has also been found in the concretions of the black shale of Ohio, and several years ago Dawson described one Ohio specimen as *Dadoxylon Newberryi*. Aside from this, very little systematic study of this wood has been made.

Field investigations during the past summer showed that petrified wood is quite common, though widely scattered, throughout parts of these states. It is especially abundant in the New Albany shale of Scott County, Indiana, and probably occurs at numerous other places throughout the state where this shale is exposed.

The thickness of the New Albany shale and the readiness with which it weathers produce a rolling topography which is devoid of striking geologic formations or extensive rock exposures. Consequently the contained silicified wood is rarely found *in situ* but as loose material in stream beds and on gently sloping weathered hillsides. The shale is quarried extensively in southern Indiana for road construction, but in most instances the petrified logs are removed from the quarry as impediments as soon as they are discovered.

One exception, however, is worthy of note. In a quarry in the vicinity of Scottsburg a stump with the lower portion of the trunk attached was found still partly buried in the shale. The specimen was three feet broad near the base, tapered to two feet at the