inlets are usually broader at the top, and narrower below, with the result that the waters enter and leave the lagoon most freely when the tide is high. As a consequence, the discrepancy between high tide levels in the two water bodies is not so great as that between the low tide levels; and the mean level of the lagoon is therefore higher than the mean level of the ocean. Changes in the number or breadth of inlets much cause changes in the mean level of the lagoon; and such changes are of common occurrence.

The shallowing or deepening of inlets; the growth of bars across the mouths of bays formerly free from such shore features, or the destruction of bars by storm waves; the narrowing of inlets by sand-spit growth, their widening by wave or current action, or the breaching of bars by new inlets formed by storm waves or by the outburst of impounded land waters; any and all of these must be potent causes of local changes in mean sea-level in harbors, bays or lagoons where are found conditions approximating those described above. Nor do the conditions described exhaust the list of those which may give rise to local differences in mean sea-level. They are merely examples intended to illustrate the fundamental principle that local changes in the form of the shore may, under appropriate conditions, produce local changes in mean sea-level. Such changes in mean sea-level may be gradual or sudden, depending on the nature of the shore changes responsible for them; and they may amount to fractions of an inch or to a number of inches, depending on the form and size of inlets and bays and on the range of the tides. Where gradual and imperceptible, yet of significant amount, they are apt wrongly to be attributed to progressive, slow coastal subsidence or coastal elevation.

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## QUANTITATIVE DETERMINATION OF ROCK COLOR

THE need for standardization of rock colors has been realized by many petrographers. Sedimentationists, especially, have desired a color standard. In meetings of the Sedimentation Committee of the National Research Council, the possibility of basing important deductions as to alteration and environment of sediments upon slight color differences has been suggested. The difficulty in investigating these suggestions has been the lack of means of detecting the requisite small color variations. The best standard of colors now in use is the Ridgway chart. In fact, its use in sedimentation has become so desirable that the Sedimentation Committee has taken steps toward the preparation of a more simple and cheaper chart, based on that of Ridgway, but especially adapted to field and laboratory descriptions of sediments.

Because the writer does not know of any application of quantitative color measurements to geologic investigation, he believes that the attention of mineralogists, petrographers, sedimentationists and others interested in color work should be called to the fact that instruments are available by means of which colors can be analyzed and synthesized quantitatively. No details of the construction and manipulation of these colorimeters need be given here for this information can be supplied by the dealers selling these instruments. Their wide range of application is indicated by their successful use in industrial plant control and research in a variety of industries including dye, paint, varnish, ink, and soap manufacturing, sugar refining and other industries. Since these instruments have proved their usefulness in practice, it is believed that they will be found to be useful also in the field of pure science wherever color is involved. Their value in petrographic research has been demonstrated by the writer in his study of the relationship between structure and color of the shales of the Cromwell Oil Field of Oklahoma.

The most simple and obvious method of determining rock color by direct comparison of rock fragments with a standard color chart is at best only qualitative. Comparisons of streaks produced in the usual way by drawing fragments of the material over an unglazed porcelain plate enable smaller color differences to be detected than is possible with the use of chips but this method is also unsatisfactory. Streaks vary with slight differences in hardness and texture of the rock as well as with differences in composition. The texture, hardness and whiteness of the streak plate and the pressure applied in obtaining the streak are also significant variables. Moreover, such a streak can not be representative of the sample as a whole because it involves too small a quantity of material and it has the added disadvantage of being neither reproducible nor easily preserved for future reference.

Many of these difficulties can be overcome, as was done in the study of the Cromwell shales, by selecting an average sample, grinding the rock and sieving it. A portion of the powder passing the one sixteenth millimeter screen can then be pressed into a cardboard frame, previously mounted on a datum card, and covered with an ordinary thin cover glass. Black binding tape such as is used in preparing lantern slides serves to hold the glass to the rest of the mount. Such a record is permanent and can be filed. It overcomes the objections of the above-mentioned methods, but it too has some disadvantages. First, the mounting of the powders is time-consuming and, secondly, after all this work has been done, the color differences detectable by the eye are not always sufficiently small to be of value in the investigation. The fundamental need, a method of greater sensitivity, remains.

Such was the case in the Cromwell problem when a timely advertisement in Science called the writer's attention to the color photometer. In order to test the applicability of the instrument to the study of the shales in question, the writer submitted samples of shale powders passing the one sixteenth millimeter screen to the dealer for trial tests. The results agreed so well with certain chemical determinations that the writer believes that he is warranted in suggesting the use of the color photometer in other investigations. When the investigation of the Cromwell shales is completed, it is hoped that the application of quantitative color data to petrographic research will be demonstrated conclusively. As stated in the beginning, the purpose of this brief paper is merely to make better known a color-determining device applicable to liquids, powders and massive solids, both heterogeneous and homogeneous, capable of giving quantitative data which can be presented graphically. Such an instrument may prove of great value in other geologic problems such as those dealing with changing environments under which sedimentary beds have been deposited, color changes produced in rocks during metamorphism, and in other types of investigation. The color of mineral streaks can now be placed on a quantitative basis. Doubtless, other applications will suggest themselves to the reader.

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## A NEW FUNDAMENTALIST STRONGHOLD

"The Des Moines University, Des Moines, Iowa, is now the property of the Baptist Bible Union of North America . . . A President has not been elected, but in the meantime the Board of Trustees announce that no one will be retained on the faculty who is not a Christian in the sense of having been born again . . . Some professors will teach no longer in the university because their views are decidedly modernistic . . . No professor will be retained who believes in evolution, or who does not accept the Bible as the infallible word of God . . . The highest educational standards will be maintained . . . Des Moines University will teach the supernaturalism of Christianity as opposed to the naturalism of modernism which is prevalent to-day."

The above, taken from a publication of the Baptist Bible Union, is published because the situation should be thoroughly understood by scientific men. Twenty of the faculty, including two deans, have resigned. The writer, who a year ago accepted a two-year contract as professor of biology, with the promise of freedom in the teaching of evolution is among those leaving.

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# QUOTATIONS

## STEEL TURNS TO RESEARCH

Science is to work for the United States Steel Corporation. To be sure, the greatest organization of its kind in the world has long had its laboratories, but it has been their main function to make more or less routine analyses and to control the processes whereby ore is converted into hundreds of products ranging from wire to girders. No startling discovery in the chemistry of iron and steel stands to their credit. The corporation has made its greatest technical strides in engineering—in lowering production costs, in introducing new machinery, in increasing tonnage. Convinced, no doubt, by the example of other large industrial organizations and above all by Sir Robert Hadfield, of Sheffield, and the great German ironmongers, the United States Steel Corporation has decided to create a department of research and technology under the direction of Dr. John Johnston, of Yale, a scientist ably qualified by technical education and experience to explore a field in which scientific and industrial honors are to be won.

Judge Gary's announcement of what his board of directors must have regarded as a daring innovation is phrased with characteristic but guarded optimism. The finance committee is to keep an eye on the research laboratory. While the corporation "has no money to waste intentionally," Judge Gary comments, "we have money to expend if necessary." Miracles are not to follow the rubbing of the lamp of science by a chemical Aladdin. "We do not expect you can go along at a very rapid rate to begin with, or, perhaps, at any time, but we will have patience, as you must all have patience."

Some research is better than none, particularly if the spirit in which it is conducted is that of the university. How successful the new department of research is destined to be must depend largely on the policy adopted. Such experienced directors of research laboratories as Dr. W. R. Whitney, of the General Electric Company, and Dr. C. Kenneth-Mees, of the Eastman Kodak Company, have argued for an absolutely free hand. Money-making must not infect the laboratory. Paradoxically, the most money is