Leon, Mexico, to eastern Washington. The occurrence in Alaska extends the geographic range of *Megalonyx* considerably to the north of its previously known distribution.

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A VESTIGE OF BABYLONIAN INFLUENCE IN THERMOMETRY

It is well known that our common measures of time and angles—in terms of degrees, hours, minutes and seconds—are derived from the ancient Sumerians of the Mesopotamian valley who made use of a sexagesimal system of numeration. It is less manifest, but nevertheless also true, that the common measure of temperature in terms of degrees Fahrenheit is likewise a product of Sumerian or Babylonian influence.

Galileo's application of the telescope to astronomical observation had an immediate and profound effect on science. On the other hand, his invention of the thermometer apparently failed at first to impress either Galileo himself or his successors in science. This fact undoubtedly is to be ascribed to the lack at that time of a standard and universally reproducible scale. The Florentine academicians and their associates subdivided the interval between the extreme cold of winter and the greatest heat of summer into an arbitrary number of equal parts—sometimes fifty; or again one or more hundreds; or occasionally 360, to correspond to the Babylonian "degree" measure of the circle. Such thermometric scales competed during the seventeenth century with others, notably those based on the medieval division into eight degrees of heat and cold. During this period there was no one scale which conventionally was preferred either as to fixed points or as to subdivisions.

Very early in the eighteenth century Roemer carried out investigations in thermometry in which he chose the boiling point of water as his higher fiducial point and the temperature of a mixture of ice and salt as the point of extreme cold. It then remained for him to subdivide the interval between these points in some suitable manner. Numerous suggestions already had been made by others, but Roemer's choice in all probability was determined by the fact that he was interested primarily in astronomy. In this field Babylonian tradition, continued in Greek, Arabic and Latin treatises, had dictated the sexagesimal subdivision. In view of this situation it seems natural that Roemer should have adopted sixty divisions for his thermometer. (Indeed, in this respect there was precedent for his action; almost a century earlier Telioux, a Roman engineer, had superimposed the sexagesimal subdivision upon a primary scale of eight degrees.) Roemer consequently designated his lowest and highest temperatures as 0 and 60, respectively. He noted that on this basis water froze at about 7½ or 8 degrees, and that normal body temperature was approximately 22½ degrees; and Roemer checked the calibration of his thermometers through the use of these intermediate or secondary fixed points.

The scale of Roemer never secured wide recognition, but it formed the basis of another one which did. Fahrenheit in 1708 visited Copenhagen and there found Roemer calibrating thermometers. As a result he was led to adopt the same fundamental principles in his own work, with but minor changes. He chose the same minimum point as Roemer; but inasmuch as Fahrenheit was a maker of scientific instruments whose attention had been directed to thermometry through meteorology, he preferred to take body temperature as his upper limit. Then too he found Roemer's sexagesimal subdivision too gross, so that Fahrenheit subdivided each of its sixty subdivisions into four parts. The freezing point of water thus became 4×8 or 32, and body temperature $4 \times 22\frac{1}{2}$ or 90. Later he changed the scale slightly so that normal body temperature should correspond to 96 instead of 90. On this modified scale he found incidentally that water boiled at 212 rather than 240. "Fahrenheit" thermometers to-day are calibrated more accurately on the basis of the freezing and boiling points of water, so that Fahrenheit's upper fixed point, body temperature, is now only an incidental intermediate point, at 98.6. Such successive modifications have served to conceal the sexagesimal subdivision in which our common or Fahrenheit measure of temperature originated. A recognition of this Babylonian basis will make clear that the figures 32 and 212 are not simply the result of an eccentric or capricious arbitrariness but represent vestiges of an ancient scale of numeration. However, the decimal system (represented by the Centigrade thermometer) appears to be in a fairer way to efface this remnant of Babylonian influence in thermometry than to displace it in the older fields of angle and time measure.

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IMMUNITY AND RESISTANCE

It is my earnest hope that Dr. Rivers's statement,[1] "Immunity is resistance to infection or injury . . . ," will help to arouse extremely high resistance to the synonymous use of the words "immunity" and "resistance." They have been used interchangeably by other writers, especially in medical publications, but that does not prove that it is desirable or proper usage. Each can serve us most satisfactorily if used to convey the idea indicated by its derivation. The word "immune" means free or exempt from any certain thing. The word "resistant" correctly used means that the object, either living or dead, offers appreciable oppo-

[1] Thomas M. Rivers, Science, 85: 107, 1942.

sition to whatever is endeavoring to attack or to overcome it, and the amount of such opposition may be slight or great. "Resistance" properly does not and should not convey the idea of complete exemption or freedom from any infectious agent or from disease in man, animals or plants. An organism may be immune from disease in the sense of distinct injury and not be immune from the infectious agent. It is true that an organism may be immune or resistant only under certain conditions, and we have to recognize the factor of biological variations. The two words "immunity" and "resistance" are not legitimately commutable and should not be used synonymously. The word resistance is too useful in its original meaning for indicating that the force (virus in this case) encounters a clearly evident degree of opposition on the part of the host either to the process of infection or to the injurious effects which might be expected to follow such infection. The word "immune" should be reserved for those cases in which there is no evidence of disease or in which the infectious agent is unable to establish itself in the host.

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VITAMIN A FOR COLOR-BLINDNESS

PUBLICITY given in the press to our report to the Southern Society for Philosophy and Psychology has resulted in a flood of inquiries which make it desirable to summarize our results for the benefit of the scientific public, omitting the study by the junior author (now in process of publication) which led up to the practical work.

(1) We have found it desirable to administer Vitamin A in doses of 25,000 units. Most cases are cleared up in from three to eight weeks by one dose per day.

(2) Administering 50,000 units per day seems to accelerate the cure; but upset some digestive tracts. We suggest to inquirers that they take one dose (25,000 units) after breakfast, and a second dose after dinner. If digestive trouble results, to reduce to one dose per day.

(3) By "clearing up" a case, we mean enabling the patient to pass a standard color-vision test on which he has previously failed. The tests involved are chiefly of the chart type (Stilling, Ishahara, etc.), administered in the naval and air services. Performance on worsted tests, however, are likewise made normal.

(4) We do not know how "permanent" the cures are. That is a matter for further research.

(5) We find, so far, no clear correlation between color-blindness and diet; nor have we definite evidence as to the effects of past infectious disorders.

(6) Color-blindness, of the so-called "red-blind" type, obviously is not the simple "sex-linked Mendelian character" which popular theories have assumed it to be. Apparently, the causes of the condition are complex.

(7) Persons who, when tested, are found to be color-blind, but who have not known it, may now reasonably be suspected of not having been color-blind very long.

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SCIENTIFIC BOOKS

DIMENSION

Dimension Theory. By WITOLD HUREWICZ and HENRY WALLMAN. 165 pp. Princeton University Press. 1941. $3.00.

A DESCRIPTION of a geometrical object has to include a list of properties concerning curvature, convexity, connectedness, etc. First in any such list, however, would have to be a specification whether the object is a solid, a surface or a curve.

If the object is simple, then this basic question concerning its geometric nature can easily be answered. The dimension of a simple object can, for instance, be characterized as the least number of parameters needed to describe its points.[1]

Up to the seventies of the last century all objects of geometry were so simple that their points could be described by parameters and equations. However, with the tremendous extension of the domain of geometry due to Cantor's theory of point sets innumerable entities were introduced which are far beyond the reach of these simple methods. They are defined by joining and intersecting infinitely many cubes and squares, by various successive approximations and limit processes, some even by processes involving infinitely many unspecified choices. Naturally, to most geometrical objects of this enormous domain the classical characterization of dimension in terms of numbers of parameters is completely inapplicable.

[1] *E.g.*, one parameter, t, is sufficient to describe the points of the circle $x = \cos t$, $y = \sin t$. Two parameters, u and v, are needed for the description of the sphere in the usual representation $x = \sin u \cos v$, $y = \sin u \sin v$, $z = \cos u$.