emulsions to blue and violet light permits the measurement of photographic magnitudes of stars whose visual or photovisual values are entirely beyond our powers. Moreover, photographic magnitudes, even without colors and consequently without reduction to a homogeneous system, could always serve some useful purpose; and so they were measured, extensively.

But this kind of usefulness is passing, and from the present confusion of photometric data this guiding precept stands clear: That no photometric investigation be undertaken which does not provide for the reduction of its results to the color system of the North Polar Sequence. Stars so faint that their color equivalents can not be determined should be observed only with instruments which give directly results on the international system. Since this system is defined by the ordinary silver-bromide emulsion used with the silvered reflector, and since the most powerful telescopes are reflectors, this demand does not seem excessive.

But you will immediately remind me that we are now in process of transforming all our silvered reflectors into aluminized mirrors. At first this promised to be a serious difficulty; but experiments at Mount Wilson have provided a simple solution. A filter of ordinary crown glass in front of the photographic plate transforms the aluminized mirror into the practical equivalent of a silvered reflector.

(9) Addressed to a Physicist

In the beginning I suggested that physicists have a way with questions. And now that you must hope I am getting near the end of things, some one will surely be ready with a last-chance query: But the total energy radiated by a star; what about that—doubtless to be expressed by some kind of a magnitude? And why be content with a crude spectral photometry that measures radiation at only two points in the spectrum?

Of course we have bolometers, radiometers and thermocouples, devices equally sensitive to radiation of all wave-lengths, and we do use them; but let it not be forgotten that you may take your telescope armed with one of these devices to the top of the highest mountain, point it at a star directly in the zenith, and still fall far short of measuring the total output of stellar energy, especially if the star be a hot one as stars go. The amazing performance of atmospheric ozone still goes on. Equivalent in amount to a thin shell only 3 or 4 millimeters thick at sea-level pressure, it still effectively blocks practically all radiation on the short-wave side of 0.29 μ. At the other end of the spectrum the immigration restrictions are less stringent; and for those remarkable low-temperature stars —the long-period variables at minimum light—the total radiation that passes the guardian molecules of our atmosphere is a thousand times that transmitted by the visual region.

These so-called radiometric magnitudes are immensely important when we look at stars as individual physical machines, because they bring us a step closer to the total energy of radiation, an item undoubtedly of great significance, which by some mystery of notation we designate as the star's bolometric magnitude—a mystery because thermocouples, radiometers and bolometers all measure exactly the same thing. Further, by blocking out various sections of the radiation transmitted by the atmosphere, we obtain with these impartial receivers additional points on the spectral energy-curve of a star and thus learn more of another item of great physical significance.

A Utopia of intellectual and instrumental accomplishment would, I suppose, include the bolometric magnitude and a complete spectral photometry for every star we know; but we do not get very far on the way toward either of these ideals. The part of a star's energy that we catch on our pin-point earth is too slight to stir the impartial recorder far out of its comparative sluggishness, and for all but the brightest stars will stand none of the dilution essential for any proper spectral photometry.

The astronomer, like the physicist, wishes to know about stars as atomic machines; but, impressed by the fact that there is more than one star in the heavens, he has also a mind full of questions about the numbers of stars of each degree of brightness and how they group themselves into systems and a system of systems extending endlessly outward into space. So he works his thermocouple and does his spectral photometry when possible, then compromises upon magnitudes which give, at the same time, measures of color, and hence a little knowledge of physical states; but, finally, for those objects so faint as to be caught only by the tip of the sensitivity curve of his photographic plate he must be content with a magnitude which tells him nothing of stellar conditions but remains a colorless datum to be fed into formulae for distances and distribution that he may learn at least something about the amazing universe of the telescope.

SCIENTIFIC EVENTS

THE VIRGIN PORT ORFORD CEDAR TRACT RESERVATION

Eleven hundred acres of virgin Port Orford cedar timber have been proclaimed a "Natural Area" by order of F. A. Silcox, chief of the U. S. Forest Service, to be kept forever in its pristine condition. This area lies within the Port Orford Cedar Experimental Forest on the South Fork of the Coquille River, which

is a part of the Siskiyou National Forest in Oregon. The withdrawal was made on the recommendation of Regional Forester Buck and Thornton T. Munger, director of the Pacific Northwest Forest Experiment Station, in accordance with a regulation of the Department of Agriculture that "typical examples of the principal forest types shall be reserved, untouched by man, for posterity to enjoy and study." The tract contains groups of cedar and is so situated that it will be safe from inroads of fire and logging.

At the present rate of cutting, virgin tracts of Port Orford cedar will soon be a rarity except on federal lands within the National Forests. The forest survey recently completed by the Federal Forest Experiment Station indicates that there is only about 1,140 million board feet of this cedar in existence, all in southwestern Oregon except for a small amount in northern California. Sixty-nine per cent. of this timber is in private ownership, 15 per cent. on the Oregon and California Railway revested grant lands managed by the Department of the Interior, and 16 per cent. on the National Forests managed by the Department of Agriculture. The annual cut in recent years averages about 48 million board feet, nearly all coming from private lands and from the Oregon and California revested lands.

It is therefore desirable for the U. S. Forest Service to set up some virgin tracts as museum pieces, so that future generations may have lasting examples of this forest tree under natural conditions.

AWARD TO DR. BOWIE

THE Queen of the Netherlands has appointed Dr. William Bowie, retired chief of the Division of Geodesy of the U. S. Coast and Geodetic Survey of the Department of Commerce, an officer of the Order of Orange-Nassau, and has presented to him, through the Minister of the Netherlands, the medallion and diploma of the order.

This honor was bestowed upon Dr. Bowie "in recognition of outstanding achievements in the interests of international science and geodesy, and his collaboration with Dr. F. A. Vening Meinesz, professor of geodesy at the University of Utrecht, the Netherlands, and a member of the Netherlands Geodetic Commission, in the determination of gravity-at-sea."

Dr. Bowie and Dr. Meinesz have worked together many years in the International Association of Geodesy, a branch of the International Geodetic and Geophysical Union. Dr. Bowie was president of that association from 1919, when it was created, until 1933, when he became president of the International Geodetic and Geophysical Union. He was succeeded as president of the International Association of Geodesy by Dr. Meinesz.

It was largely through this association that Dr. Bowie became interested in the work of Dr. Meinesz, who had devised and constructed an apparatus by means of which accurate determinations of the values of gravity can be made aboard a submarine. Dr. Bowie was twice instrumental in bringing Dr. Meinesz to the United States to conduct expeditions for the determination of gravity-at-sea on submarines of the U. S. Navy operating in West Indian waters.

Dr. Bowie was retired from the U. S. Coast and Geodetic Survey in December, 1936, after 41½ years of service, during twenty-seven of which he was chief of the Division of Geodesy.

He has received honorary degrees from Trinity College, Lehigh University, George Washington University and the University of Edinburgh. He holds also honorary memberships in the Academy of Sciences of France, the Academy of Sciences of Norway, the National Academy of History and Geography (Mexico) and the Russian Geographical Society. In 1937, he was awarded the Elliot Cresson Medal by the Franklin Institute of Philadelphia for his contributions to the science of geodesy.

Dr. Bowie is a member of the National Academy of Sciences; the Philosophical Society of Washington, of which he was president in 1926; the Washington Academy of Sciences, of which he was president in 1930; the Washington Society of Engineers, of which he was president in 1914; the American Society of Civil Engineers; the American Astronomical Society, and other leading national and international scientific societies. He is the author of a number of publications of the Coast and Geodetic Survey on the varied branches of geodesy.

LECTURESHIP IN HONOR OF DR. JULIUS STIEGLITZ

DR. GUSTAV EGLOFF, chairman of the Chicago Section Committee of the American Chemical Society, and Dr. Paul N. Leech, chairman of the Alumni Committee of the University of Chicago, have given out the following appeal for funds to establish a lectureship foundation in the memory of Dr. Julius Stieglitz, distinguished chemist and teacher, who died early in 1937:

> You know, through his work and that of his former students, the importance of the contributions made to American chemistry by Dr. Julius Stieglitz, who passed on early this year. In a sense, your company is a beneficiary of his learning and his power to illuminate the subject of chemistry and make it a living thing in the minds of his students.
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> Those who loved Dr. Stieglitz, who benefited by his instruction and who revere his memory, are contributing to a fund to endow a Julius Stieglitz Lectureship to carry on