

of only two minutes. The scale of the photographs, however, is so small that great magnification is necessary, and many details must be obscured, although the definition at the center of the small plates used appears to be good. There must be some practical limit to the decrease in the ratio of focus to aperture, and Schaeberle has apparently been working near, if not beyond it. Vogel gives some wonderfully good results obtained with a Schmidt mirror, using an aperture of 24 cm. which makes the ratio of aperture to focus 1:3.86. With the full aperture of 41 cm. and an exposure of ten minutes, many more stars were photographed than are visible in the great Lick refractor of more than 91 cm. aperture.

SOME CONSIDERATIONS REGARDING THE NUMBER OF THE STARS.

THE above title is the subject of a paper in the May number of the *Monthly Notices* of the Royal Astronomical Society. It is written by Miss Winnifred Gibson, B.Sc., and communicated by Professor Karl Pearson, F.R.S.

The problem is one of the deepest interest, but its solution is rendered difficult, if not impossible at the present time, by lack of fundamental data. The distribution of the stars would be readily determinable, if the parallaxes of a sufficient number had been determined. After confessing the lack of such materials, Miss Gibson, nevertheless, proceeds to an elaborate discussion of such data as exist. She arrives at the conclusion, for the brighter stars, that 'There is no sensible relation between magnitude and parallax.' The chief trouble with this conclusion is that it is derived from entirely inadequate data. The stars, whose parallaxes are taken into consideration, are of the ninth magnitude, and brighter. Of such stars there are in the sky about 150,000. For obtaining any law of relation between the magnitudes and distances of all these stars, the parallaxes of 72 stars, about one in 2,000, are available. Neither is there evidence that this small number is distributed by chance among the stars, nor that the parallax in many cases is sufficiently exact for purposes of discussion. Results based upon

such meager data must have little or no value, however skillful and elaborate the treatment may be. Not much more can be said of that part of the discussion relating to proper motions and colors.

The latter part of the paper is concerned with the relation of magnitudes and frequencies, and gives results which are in substantial agreement with those of Professor E. C. Pickering, recently published, although Miss Gibson prefers a somewhat different formula. The author confines her attention to the brighter stars. The problem becomes at once more interesting and more difficult as it is extended to the fainter stars. Miss Gibson complicates the problem by assuming that magnitude is largely a physiological phenomenon, and hence that 'It is hardly conceivable that a scale of pure magnitudes could have any meaning in physical nature.' This is quite erroneous, since the determination of magnitudes, whether by visual or photographic methods, is simply the determination of the intensity of certain radiations, which surely have an objective reality based on physical conditions.

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RECENT VERTEBRATE PALEONTOLOGY.

FROM the Brazilian Coal Commission, through Dr. I. C. White, state geologist of West Virginia, the American Museum of Natural History has just received the gift of a number of natural casts of a small Permian reptile closely related to the *Mesosaurus* of South Africa. These Brazilian remains have been carefully studied by J. H. McGregor for a memoir which will be published by the commission, and which for the first time gives us a complete knowledge of the anatomy of this extremely ancient reptile. It is related to the genus *Stereosternum* Cope, also from Brazil, which Baur made the type of the order Proganosauria, under the impression that these were very ancient and generalized reptiles. It is true they are very ancient but are not generalized, they are rather already considerably specialized for aquatic life, as shown in Dr. McGregor's restoration of the skeleton and

of the probable external form of this animal.

In this connection Dr. R. Broom, of Victoria College, Stellenbosch, South Africa, writes, under date of July 3: "An interesting point to remember is the horizon of *Mesosaurus* in South Africa. It is in the very lowest of the Permian beds—beds which the geologists are inclined to regard as Carboniferous, though I hold it is Permian. It is 5,000–6,000 feet below the Upper Permian beds, and perhaps the oldest true reptile known. *Mesosaurus* has nothing to do with the *Plesiosa*."

H. F. O.

AMERICAN MUSEUM OF NATURAL HISTORY,
NEW YORK, July 30, 1906.

THE PURE FOOD BILL.¹

An Act preventing the manufacture, sale or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines and liquors, and for regulating the foods, drugs, medicines and liquors, and for regulating traffic therein, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

[Public—No. 384.]

SEC. 1. That it shall be unlawful for any person to manufacture within any territory or the District of Columbia any article of food or drug which is adulterated or misbranded, within the meaning of this act; and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and for each offense shall, upon conviction thereof, be fined not to exceed \$500 or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court, and for each subsequent offense and conviction thereof shall be fined not less than \$1,000 or sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court.

SEC. 2. That the introduction into any state or territory or the District of Columbia from any other state or territory or the District of Columbia, or from any foreign country, or shipment to any foreign country of any article

of food or drug which is adulterated or misbranded, within the meaning of this act, is hereby prohibited; and any person who shall ship or deliver for shipment from any state or territory or the District of Columbia to any other state or territory or the District of Columbia, or to a foreign country, or who shall receive in any state or territory or the District of Columbia from any other state or territory or the District of Columbia, or foreign country, and having so received, shall deliver, in original unbroken packages, for pay or otherwise, or offer to deliver to any other person, any such article so adulterated or misbranded within the meaning of this act, or any person who shall sell or offer for sale in the District of Columbia or the territories of the United States any such adulterated or misbranded foods or drugs, or export or offer to export the same to any foreign country, shall be guilty of a misdemeanor, and for such offense be fined not exceeding two hundred dollars for the first offense, and upon conviction for each subsequent offense not exceeding three hundred dollars or be imprisoned not exceeding one year, or both, in the discretion of the court: *Provided*, That no article shall be deemed misbranded or adulterated within the provisions of this act when intended for export to any foreign country and prepared or packed according to the specifications or direction of the foreign purchaser when no substance is used in the preparation or packing thereof in conflict with the laws of the foreign country, but this proviso shall not exempt said article from the operation of any of the other provisions of this act.

SEC. 3. That the Secretary of the Treasury, the Secretary of Agriculture, and the Secretary of Commerce and Labor shall make uniform rules and regulations for carrying out the provisions of this act, including the collection and examination of specimens of foods and drugs manufactured or offered for sale in the District of Columbia, or in any territory of the United States, or which shall be offered for sale in unbroken packages in any state other than that in which they shall have been respectively manufactured or produced, or which shall be received from any foreign

¹Text of the bill adopted at the last session of the congress, approved by the president on June 30.