

sulphide are required per annum. Dr. Naef has found that by treating nitre-cake at 300°–350° C. with superheated steam 90 per cent. of the free acid is driven off, but the product is too dilute to concentrate.

VOL. II., No. 4, of the Memoirs of the College of Science, Kyoto Imperial University, contains a series of metallographical publications by Prof. Chikashige and his pupils. These deal with the working out of the equilibrium diagrams of the following series of binary alloys: (1) Tellurium and aluminium, and (2) selenium with antimony, cadmium, zinc, and aluminium respectively. The methods adopted are those in general use and do not call for any special mention. The authors content themselves with the determination of the main features of the diagrams, without saying anywhere whether any of the alloys are likely to prove of practical value.

THE reviewer of Dr. Knox's book on "Radiography and Radio-therapeutics," in NATURE of March 14, remarked: "We regret the omission of the bibliography." The publishers direct our attention to the fact that a selection of the literature of the subject appears on p. iv. at the end of the volume. We are sorry that our reviewer did not notice this bibliography in spite of having looked for it, and that he incorrectly said it had been omitted.

OUR ASTRONOMICAL COLUMN.

PLANETARY PERTURBATIONS AND ÆTHER-DRIFT.—In a paper entitled "Continued Discussion of the Astronomical and Gravitational Bearings of the Electrical Theory of Matter" (*Philosophical Magazine*, February, 1918), Sir Oliver Lodge continues a discussion commenced by the suggestion that the shift in Mercury's perihelion might be explained by a drift of the solar system through the æther. Prof. Eddington showed that a drift that would account for this would bring inadmissibly large errors into the other elements of the inner planets. Sir Oliver Lodge admits an error in his former work in the following words: "If the additional inertia due to motion is acted on by gravity the varying factor m will enter twice into the equation of motion and the perturbation will be increased instead of being annihilated." Making this change, he examines once more whether it is possible to find a drift that will satisfy the observed perturbations within their limits of error. After many trials, he concludes that they cannot all be satisfied in this way. He tends to the conclusion that gravity has joined the conspiracy to defeat our efforts to detect motion through the æther, and that we are led to accept the conclusion that the gravitation-constant itself is a function of the speed of the attracting masses. In support of this he quotes some electrical results which lead him to believe that electrical attraction does actually vary with speed. "If such a fact be established [for gravity] it may begin to throw some light on the family relationship of that force."

PERTURBATIONS OF NEPTUNE'S SATELLITE.—In a communication to the *Observatory* for March, Prof. Armellini states the chief results of an investigation referring to the well-known perturbations of the satellite of Neptune. The pole of the satellite's orbit describes a circle about a point in R.A. 288° and declination 40°, and two hypotheses have been suggested to account for this motion. Tisserand attributed it to the attraction of the protuberant matter about the planet's equator, whilst H. Struve suggested that it might be due to some unknown perturbing mass. Prof. Armellini has investigated the latter hypothesis on the supposition that the unknown body is a satel-

lite, which may not have been observed on account of its small mass. He has shown that a satellite having a mass sufficient to explain the observed perturbations would probably not be much fainter than the 14th magnitude, and would be unlikely to have escaped detection. Struve's hypothesis is accordingly considered much less probable than that of Tisserand.

MOTION OF OUR STELLAR SYSTEM.—Dr. V. M. Slipper, director of the Lowell Observatory, has made a preliminary investigation of the motion of our stellar system, on the supposition that the spiral nebulae are stellar systems, similar to our own, situated at very great distances (Proc. American Philos. Soc., No. 5, 1917; quoted in Journ. R.A.S. Canada, vol. xii., p. 72). The radial velocities of twenty-five spiral nebulae have been determined, and the motion of our system with respect to them has been derived in the same way as that of the sun with respect to the stars of our own system. The somewhat scanty material available indicates that we are moving in the direction of R.A. 22 hours, and declination -22° , with a velocity of about 700 km. per second. Dr. Slipper considers that these observations strengthen the view that our stellar system and the Milky Way are to be regarded as a great spiral nebula which we see from within, and that if the solar system has evolved from a nebula, the nebula was probably not one of the class of spirals dealt with in this investigation.

FOOD RATIONS FOR MANUAL WORKERS AND SCIENTIFIC LABORATORIES.

IT has been announced in the Press that the Ministry of Food intends to grant extra rations to manual workers from some date after April 7. The extra ration will not be ordinary butcher's meat, but bacon; and the eligibility of applicants will be determined by sub-committees of the local Food Control Committees, to which the Food Ministry will issue a classification of those persons entitled to extra food. The motive of this proposal is evidently sound from the scientific point of view. Considerable difficulties are, however, likely to arise in practice owing to the lack of exact knowledge respecting the energy needs of different kinds of industrial work. Relatively few experiments have been made and published, those of Amar upon metal filers being the best known. It is to be hoped that the scientific advisers of the Food Ministry will organise physiological investigations to elucidate disputed points. Complete calorimetric measurements are, of course, impracticable, but sufficiently precise results can be reached through a study of the respiratory metabolism by Zuntz's method, the apparatus needed for which is portable.

The Medical Research Committee has recently brought to the notice of Lord Rhondda the special difficulties confronting the directors of pathological and other scientific laboratories in the regulations relating to food supply. Many instances have been brought to the notice of the committee in which scientific work of the highest national importance has been endangered by difficulties in obtaining under existing conditions necessary foodstuffs in sufficient amount or variety, though the total amount required is quite negligible in relation to the general food supply. The Ministry of Food has now issued the following memorandum for the guidance of Food Control Committees:—

SUPPLIES OF FOODSTUFFS TO PATHOLOGICAL LABORATORIES.

(1) Lord Rhondda's attention has been directed to the difficulties experienced by scientific laboratories in obtaining the small quantities of foodstuffs required by them for the purposes of their scientific work.