of the unsoftened and softened waters are given which permit of a fair comparison being made as to the suitability of the various types for special purposes. Of the seventeen softeners, fourteen are fitted with filters, two of them having sand filters, and the others woodwool, or sponge filters.

WE have received vol. ii. of the *Transactions* of the North Staffordshire Ceramic Society. The Society has a membership of thirty, and seven papers have been read before the members during the session. Of special interest is a paper by Messrs. Hopwood and Jackson on the nature and origin of the abnormal red, blue and black colorations of fire-clay ware. The red colorations are found to be due to the conversion of the iron in the clay substance into free ferric oxide, the black principally to free carbon, whilst the external vitreous blue films of blue-fired clay-wares are found to consist of a basic ferrous silicate.

THE much debated question regarding the dual nature of chromium solutions as manifested in the green and violet colour is again discussed by Messrs. Richards and Bonnet in a recent number of the *Proceedings* of the American Academy. The authors' experiments and previous observations seem to be most easily explainable on the assumption that the violet solutions of, say, chromium sulphate contain the salt in a state comparable to that of other normal salts, whilst the green solutions are due to hydrolysis resulting in the production of free acid and one or more complex basic salts.

IN the quarterly statement of the Palestine Exploration Fund Mr. W. Ackroyd discusses the cause of the saltness of the Dead Sea. Facts are brought forward which seem to indicate that the saltness cannot be entirely due to accumulation of chlorides derived from the Palestine rocks by solvent denudation or the cutting off of an arm of the Red Sea by the rising of Palestine in past ages followed by evaporation of the solution. The author brings evidence forward in favour of a third cause, which is perhaps more important than either, viz. the atmospheric transportation of salt from the Mediterranean.

A THIRD revised edition of part ii. of "Machine Design," by Prof. Forrest R. Jones, of Cornell University, has been published in this country by Messrs. Chapman and Hall. This part of the work deals with the form, strength, and proportions of parts, and the new issue has been increased by about eighty pages of new matter.

THE additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Mrs. Hughes; a White-collared Mangabey (*Cercocebus collaris*) from West Africa, presented by Mr. H. Ion; a Chacma Baboon (*Papio porcarius*) from South Africa, presented by Mr. James Adams; a Levaillant's Cynictis (*Cynictis penicillata*) from South Africa, presented by Lady Constance Ryder; a Spotted Ichneumon (*Herpestes nigropunctatus*) from Nepal, presented by Mr. S. D. Pritchard; two Herring Gulls (*Larus argentatus*), European, presented by Mr. F. H. Haines; a Barn Owl (*Strix flammea*), British, presented by Master C. Fox; a — Sheep (*Ovis* sp. inc) from Baluchistan, two Waxwings (*Ampelis garrulus*), European; a Grey Squirrel (*Sciurus cinereus*) from North America, a Brazilian Tortoise (*Testudo tabulata*) from South America, two Ceylonese Terrapins (*Nicoria trijuga*) from India, two Derbian Sternotheres (*Sternothoerus derbianus*) from West Africa, deposited; a Humboldt's Lagothrix (*Lagothrix humboldti*), a Red-faced Ouakari (*Ouacaria rubicunda*) from the Upper Amazons, purchased.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN FEBRUARY:—

Feb. 1. 12h. Saturn in conjunction with the sun.
4. 8h. 41m. Minimum of Algol (β Persei).
7. 5h. 30m. ,, ,, ,,
8. 6h. 17m. Transit (ingress) of Jupiter's Sat. IV. (Callisto).
9. 15h. Ceres in conjunction with moon. Ceres 0° 8′ N.
,, 21h. Mercury at greatest elongation. 25° 52′ W.
12. 16h. Venus in conjunction with moon. ♀ 4° 8′ S.
14. Venus. Illuminated portion of disc = 0·797.
24. 5h. 57m. to 7h. 15m. Moon occults α Tauri (Aldebaran, Mag. 1·1).
25. 17h. Mercury in conjunction with Saturn. Mercury 0° 49′ S.
,, 17h. Mars in conjunction with Jupiter. Mars 0° 30′ N.
27. 7h. 13m. Minimum of Algol (β Persei).
29. 8h. 53m. to 9h. 46m. Moon occults *o* Leonis (mag. 3·8).

VARIABILITY OF THE MINOR PLANET IRIS.—A telegram from Prof. Pickering, through the Kiel Centralstelle, announces that Prof. Wendell has discovered a periodic variability in the brightness of the minor planet (7) Iris. The period of the changes is six hours, and the range of variability about one-quarter of a magnitude.

HARVARD MERIDIAN PHOTOMETER OBSERVATIONS.—Part i. vol. xlvi. of the Harvard College Observatory *Annals* contains the tabulated results of the meridian photometer observations made by Prof. Solon. I. Bailey at Arequipa and Cambridge (Mass.) during the years 1899–1902. Chapter i. contains the reduced observations of some 4500 stars situated south of −30° declination made at the southern station during 1899, the stars observed being generally selected from the Argentine General and Cordoba Zone Catalogues.

One of the chapters contains the results of a series of observations made at Cambridge (1900–1902) in order to produce a catalogue of standard stellar magnitudes for regions regularly distributed throughout the sky. To this end the sky was divided into 432 regions, each approximately 10° square, and one star of about the fifth magnitude was photometrically observed in each region, care being taken to select, wherever possible, a star having a first-type spectrum. All the stars were compared with λ Ursæ Minoris and other standard comparison stars, and on reducing the observations it was soon apparent that the results obtained from λ were systematically different from those obtained from the other stars. This difference indicates an increase of two-tenths of a magnitude in the brightness of λ Ursæ Minoris, which may either be due to a personal equation depending on the colour or to a real variation in the star.

LIGHT CHANGES OF ε AURIGÆ.—In Nos. 3918, 3919 and 3920 of the *Astronomische Nachrichten* Herr H. Ludendorff publishes the results of an exhaustive research as to the most probable data for the light variation of ε Aurigæ.

He first gives and discusses the observational results of Argelander, Heis, Schwab, Plassman, and thirteen other observers, and then, applying suitable weights to the various results, obtains a mean result by the method of least squares. The resulting elements obtained from this analysis are

$$T = 2415476 \text{ days} = \text{April } 1, 1901,$$
$$t = 207\text{d.}\quad t_m = 313\text{d.},$$
$$T = 2415840 = \text{March } 31, 1902,$$

where T = the epoch at which the light commences to decrease from its normal magnitude, t = the time taken for the complete decrease to minimum or the corresponding increase to maximum, t_0 = the duration of the constant minimum, and T_0 = the epoch of the mean minimum.

Summarising the results the author finds that the star has a normal magnitude of 3·35, decreases 0·73 mag. in 207 days, remains at constant minimum for 313 days, and then returns to the normal magnitude again in 207 days. After these changes it remains constant for 25·13 years. Thus the complete period for this star becomes 27·12 years, or 9905 days, of which only 1·99 years are occupied by the actual variation.