

The whole was enclosed in a bath the temperature of which could be varied between the limits stated above. Dr. Bridgman finds that the compressibility and thermal expansion of a liquid may decrease with increasing temperature and may increase with increase of pressure. He is disposed to attribute these remarkable results to deformation of the actual molecules when forced into contact at these high pressures.

PROBABLY no branch of the community is more open to be defrauded than those who must perforce exclude carbohydrates from their diet. The unsuspecting patient purchases foods which are not only glaringly misrepresented, but also may be positively harmful to him. It is to be feared, moreover, that the medical adviser is often but little better informed, though in default of a source of trustworthy information as to the nature of the commercial products he can scarcely be held responsible. The Connecticut Agricultural Experiment Station has done great service, therefore, in issuing a lengthy report dealing with the composition and merits of all the so-called diabetic flours, breads, biscuits, and other diabetic foods of both European and American origin—the list is an exhaustive one. To all but the few initiated the result of the inquiry must be very startling. By far the greater number of the foods examined were definitely fraudulent in that they did not fulfil the claims made for them, and many of them indeed contained as much starch as is present in ordinary white bread. The report also deals with the excessive cost of such foods, which has, in the past, rendered their use almost prohibitive to the poor man. A select list of genuine diabetic foods, which return good value, is given, in which it is satisfactory to find the products of British firms of repute. Our chief purpose in directing attention to the report is, however, to urge the necessity of some control being exercised over the indiscriminate misrepresentation of foodstuffs of which this is a type with its attendant menace to the public health. The report merits the widest possible publication.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES FOR OCTOBER :—

- Oct. 2. 3h. om. Mars at quadrature to the Sun.
 „ 14h. om. Jupiter at quadrature to the Sun.
 6. 6h. 21m. Jupiter in conjunction with the Moon (Jupiter $4^{\circ} 51' N.$).
 8. 3h. 37m. Uranus in conjunction with the Moon (Uranus $3^{\circ} 35' N.$).
 13. 14h. om. Uranus stationary.
 14. 9h. om. Venus nearest the Sun.
 19. 9h. 19m. Saturn in conjunction with the Moon (Saturn $6^{\circ} 56' S.$).
 21. 13h. 7m. Mars in conjunction with the Moon (Mars $3^{\circ} 55' S.$).
 „ 18h. om. Neptune at quadrature to the Sun.
 22. 7h. 54m. Neptune in conjunction with the Moon (Neptune $4^{\circ} 53' S.$).
 27. 5h. om. Uranus at quadrature to the Sun.
 „ 8h. 31m. Venus in conjunction with the Moon (Venus $3^{\circ} 17' N.$).
 30. 20h. 17m. Mercury in conjunction with the Moon (Mercury $2^{\circ} 2' N.$).
 31. 13h. om. Neptune stationary.

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COMETS 1913*b* (METCALF) AND 1913*c* (NEUJMIN).—Prof. H. Kobold's ephemeris for comet Metcalf during the present week is as follows (*Astronomische Nachrichten*, No. 4682):—

		M.T. Berlin.							
		R.A. (true)			Dec. (true)		Mag.		
		h.	m.	s.	°	'			
Oct.	2	...	23	18	26	...	+72 6'0	...	8.2
	3	...	22	54	25	...	69 52.2		
	4	...	22	34	49	...	67 23.4		
	5	...	22	18	45	...	64 42.1	...	8.0
	6	...	22	5	26	...	61 51.4		
	7	...	21	54	26	...	58 53.3		
	8	...	21	45	16	...	55 50.0		
	9	...	21	37	9	...	+52 43.7	...	8.0

This comet is now in Cepheus and rapidly reducing its northern declination, moving towards the constellation of Cygnus. It is well up above the horizon and gaining in magnitude.

On the other hand, comet Neujmin is decreasing in magnitude, becoming fainter than magnitude 12. This comet seems to be moving in an elliptical orbit, and Prof. Cohn finds a period of nine years. Its appearance has attracted the attention of numerous observers, since while the nucleus has appeared quite stellar, the gaseous envelope has been alternating between visibility and disappearance.

ANOTHER COMET.—A Kiel telegram, dated September 27, distributes the information communicated by Prof. Hussey that Mr. Delaren on September 26, 10h. 29.2m. M.T. Laplata, discovered a comet of the tenth magnitude, its position being given as R.A. 21h. 54m. 16s. and declination $2^{\circ} 34' 27'' S.$ In the issue of *The Times* for September 30 it is suggested that probably this comet may be identical with Westphal's comet, which is now due, and for which a search has been continually made. If it be Westphal's, then it will move northward during the next month and will increase considerably in brightness, possibly becoming visible to the naked eye. At its appearance in 1852 it was a fairly conspicuous naked eye object.

THE SPECTRUM OF α -CANUM VENATICORUM.—In two previous notes in this column (June 5 and July 24) reference has been made to Prof. Belopolsky's observations of the spectrum of this star, the lines in the spectrum showing striking variations of a periodic nature. The *Astronomische Nachrichten*, No. 4681, contains now the preliminary discussion of a large number of spectrograms, sixty-seven in number, which he has been able to secure in the interval between April 15 and June 23. All the photographs were taken with the 30-inch and a three-prism spectrograph, the exposures lasting one hour; an iron comparison was photographed twice at each exposure. In the present communication Prof. Belopolsky first describes in detail the appearance of the lines observed. From the measures of the intensity of the line $\lambda 413.00$ he finds a period of 5.50 days, and he places several other lines in the same category, *i.e.* they become bright at the same time as $\lambda 413.00$. Another group of lines behaves in an opposite manner, disappearing when the former group become more intense; the period is also very near 5.50 days. Other lines such as hydrogen, magnesium, calcium, and iron display little if any change. From the line of sight measures he finds a certain group of lines, which includes H., Mg., and Fe., which indicate no changes dependent on the 5.5 day period, while other lines display variations of radial velocity equal in period to that of the intensity of the lines. Prof. Belopolsky suggests as an explanation of the above and other observations that a gaseous satellite or a gas ring moves round

a central body, but he finds that there are several details that are difficult to explain which will perhaps be cleared up when more material has been collected.

THE WAVE-LENGTHS OF CERTAIN IRON LINES.—It is important for the accurate determination of wave-lengths in a spectrum to have available a large number of standard wave-lengths well distributed over the whole length of the spectrum. The work which the Solar Union initiated in this respect has been most valuable, and the task of determining more constants and of securing greater accuracy is no light one. By the aid of a grant of the Martin Kellogg fellowship in the Lick Observatory and of the generosity of MM. Buisson and Fabry, who placed the necessary apparatus and also constant help and advice at his service, Mr. Keivin Burns has been able to make a series of interference measures of standards in the iron spectrum between the limits $\lambda\lambda 5434\text{Å}$ and 8824Å . The results of this research are recorded in Lick Bulletin, No. 233, and, in addition to the international standards already determined between the above-mentioned limits, he has added another one hundred and nineteen lines in regions which were lacking in international standard lines. Small discrepancies in different measures of some standard lines have led to the consideration of their variability of wave-length. Mr. Burns has had access to the manuscript of Dr. Goos, in which a special study has been made of the source of this variability, and he agrees entirely with the view, namely, that "Dr. Goos insists on the necessity of determining exactly what conditions the arc is to used." In this journal for September 11 last, further details will be found regarding the specified conditions for the determinations of further standards which were recommended by the committee of the Solar Union on standard wave-lengths at the recent meeting in Bonn.

THE ANTIQUITY OF MAN IN SOUTH AMERICA.¹

THE problem of the antiquity of man in South America has given rise to many papers and much discussion in various languages, and it became necessary for a trained anthropologist and geologist to study on the spot the human remains and the exact mode of their occurrence. Dr. A. Hrdlička was undoubtedly the anthropologist best fitted for the investigation, as he has an unequalled knowledge of the physical anthropology of the American Indian and had already summarised his own investigations on the antiquity of man in North America in Bulletin 33 of the Bureau of American Ethnology (1907), where he states his conclusion that "no human bones of undisputed geological antiquity are known," and that the remains exhibit a "close affinity to or identity with those of the modern Indian."

Mr. Bailey Willis, of the U.S. Geological Survey, who had done important work on the loess and related formations in North America and China, accompanied Dr. Hrdlička to Argentina in May, 1910. The Argentine men of science received them very cordially, and facilitated their work. Most of the specimens they were to examine had been described by Prof. F. Ameghino, to whose energy and enthusiasm South American palæontology owes so much, and it must have saddened his last hours to know—if indeed he admitted it—that zeal is a poor substitute for knowledge when the details of human anatomy are in question.

¹ "Early Man in South America." By Ales Hrdlička, in collaboration with W. H. Holmes, Bailey Willis, Fred E. Wright, and Clarence N. Fenner. Pp. xv+405+68. (Smithsonian Institution, Bureau of American Ethnology, Bulletin 52. Washington, 1912.)

Mr. Bailey Willis gives an excellent account of the geology of central eastern Argentina, more especially of the Pampean terrane, which is a remarkably uniform deposit of fine-grained earth, probably an eolian formation of desert plateau origin, transported by rivers to the lowlands, but during arid episodes the alluvium was partially converted into eolian loess. There is no evidence at present that man lived during Pampean times, but his remains have been found in the Upper Pampean and Post Pampean, also mainly eolian loess formations, which lie in hollows sculptured in the surface of the Pampean, also in many cases there is a distinct unconformity beneath the deposits of the Upper Pampean. A great deal has been written about the *tierra cocida*, or burnt earth which occurs in the Pampean terrane at various horizons; many of these may have been due to the burning of grasses, but there is nothing to connect the burnt earths of the Pampean with man.

Messrs. F. E. Wright and C. N. Fenner present details of their petrographic studies of specimens of the loess, *tierra cocida*, and *scoriae*. They state that many specimens of *tierra cocida* are so large and compact that one is forced to assume long-continued and confined heating at a fairly high temperature, such as would be encountered near the contact of an intrusive igneous or volcanic mass, but not beneath an open fire made of grass or small timber.

Dr. Hrdlička discusses the peculiar stone industries of the Argentine coast. Ameghino considered that the "split-stone" industry "is in certain respects more primitive than that of the coliths of Europe," referring it to the Middle Pliocene, and that it was preceded by a "broken-stone" industry. Dr. F. F. Outes denied the distinctiveness and great antiquity of these techniques, and Hrdlička confirms him. Dr. W. H. Holmes supplies a valuable critical study of the stone implements collected by the expedition, which should be read by European archaeologists, as it contains information of general interest.

The greater part of the book consists of a discussion by Dr. Hrdlička of the human remains; his system is to note the history and earlier reports, then to give the result of his own examination, and to conclude with critical remarks. He first deals with the dolichocephalic skulls found in the caves at Lagoa Santa, Brazil, and states that there is no evidence that they belonged to a race which lived contemporaneously with the extinct species of animals found in the same caves. Similarly the Carcaraña, Rio Negro, Saladero, Fontezuelas, and other remains have no solid claims to geological antiquity. The *Homo caputinclinatus* and *H. sinemonto* of Ameghino prove to be skulls of ordinary Indian type, with no title to antiquity; the same holds good for *H. (Prothomo) pamphaeus*, despite Ameghino's statement that it is the "earliest human representative—if not even a predecessor of man." Concerning the fragmentary calvarium, *Diprothomo platensis*, of reputed Lower Pliocene origin, Hrdlička supports Schwalbe's statement that "all the features dwelt upon by Ameghino are referable to a *wholly false orientation* of the specimen." Bailey Willis cannot give his support to the statement that the calvarium was really dug out of undisturbed ancient Pampean. Finally, the atlas and femur of *Tetraprothomo argentinus*, of supposed Upper Miocene age, have been subjected to a searching analysis by Hrdlička, with the result that there is nothing to distinguish the former from the atlas of a modern Indian, and the femur is that of a carnivore, probably of an extinct form of one of the Felidæ. Bailey Willis "does not consider the age of the so-called Monte Hermoso formation [in which the remains were found] definitely established," nor does he "attach any significance to