of the head; the nucleus was small and not very well defined.

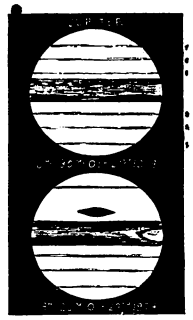
This comet differs considerably in general appearance from the comet now in *ursæ minor*. The head of B was large and broad, and its tail spread out greatly. Comet C has a small, narrow head with a very long slender shaft-like tail running from it in a straight line.

E. E. BARNARD.

NASHVILLE, TENN., *August* 26.

JUPITER.

The following cut represents the planet Jupiter on October 21st and October 29th, 1879, as seen with the 18½ inch Chicago refractor, with power 638.



The numbers on the right indicate the faint belts, which were systematically arranged on either side of the planet's equator.

The great Equatorial Belt, crossing the center of the disc, was composed of two separate belts, being divided by an irregular rift extending through the central portion. The color of this belt was reddish-brown-brick color, and the total width was 15,780 miles.

The great red spot shown in the center of the disc, on October 29th, was essentially of the same color as the equatorial belt, only more brilliant; it was about 30,000 miles in length and 8000 in breadth. Under fair atmospheric conditions, the equatorial belt was always visible up to the edge of the disc, with very slight diminution of color.

CORRESPONDENCE.

COMET *b*., 1881.

HARVARD COLLEGE OBSERVATORY,
CAMBRIDGE, U. S. *September* 13, 1881.

To the Editor of "SCIENCE."

SIR:—The spectrum of comet *b*, 1881, according to Dr. Konkoly (*Observatory*, 53, p. 257) contains five bright bands. From the mean of measures made with different spectroscopes on different nights, their wave-lengths in millionths of a millimetre were found to be 560, 545, 515, 472 and 468. The first, third and fourth of these bands are evidently due to carbon and, as Dr. Vogel has shown, are coincident with those of the banded stars of Secchi's fourth type. The other two bands appear to coincide with those of Ll. 13412. Last winter the spectrum of this star was found to consist mainly of bands having wave-lengths 545, 486 and 466 (*Nature*, xxiii, 604). The line 486 is probably due to hydrogen. The singular kinship of comets and banded stars is thus confirmed by a star whose spectrum seems to be quite unique.

EDWARD C. PICKERING.

To the Editor of "SCIENCE."

About two weeks ago, I found that one of the turtles which I keep for experimental purposes, a *Chrysemys picta* had laid eggs; all but one of these had been devoured whether by the turtle itself (as I have known to be the case with the same species, when kept in captivity) or by some alligators living in the same tank I could not discover. The perfect egg, I imbedded in moist sand, after carefully washing it, and finding yesterday, that it had not undergone development, I opened it and to my surprise found a living maggot, the larva probably of the *Musca vomitoria*, creeping around actively in the space between the half dessicated yolk and the shell membrane. It measured about four millimeters in length. As it crawled out of the aperture in the shell which I had made I threw the specimen away as it did not show the original anomoly.

Analogous observations have been made in the chick's egg. Cases are not infrequent where one egg has enclosed another or even several eggs, legs of beetles, wisps of straw and other foreign bodies. But this is I believe the first case where a living animal has been found in an egg. Of course the explanation of its presence is the same as in the case of the other substances referred to.

E. C. SPITZKA.

BOOKS RECEIVED.

ELEMENTS OF ALGEBRA, by G. A. WENTWORTH, A. M., PROFESSOR OF MATHEMATICS IN PHILLIPS EXETER ACADEMY, 8° BOSTON. Ginn & Heath, 1881; viii, 380 pp.

This addition to American a gebraic literature is the sort of book that is to be expected from a live teacher. It bears the stamp of experience upon it and gives evidence throughout of the one end and aim of teaching beginners in algebra the art of algebraic manipulation. We say the art rather than the science, because the aim is clearly to familiarize the pupil with the *art*, to teach him *how* to manipulate rather than to lay stress upon the reasons for the processes, the author being evidently a disciple of Thomas Hill in his belief "*Facts before reasoning*." This is shown by such statements as "From these it may be assumed, etc."; "It may be verified that, etc."

The author has paid "particular attention to brevity and perspicuity in definitions," a thing which cannot be too highly commended, and without which any algebra, however good in other respects, will not succeed.

This matter of definitions is, as every teacher understands, a very important matter, if not for the algebra itself, then at least as a matter of right training and clear thinking. Definitions should be memorized, but memorization is not enough; they must be thoroughly understood. With those teachers who do not agree with this view we will have no disagreement, for the student trained to thoroughly comprehend is generally found by that very process to have secured that definition in his memory. In a text book, therefore, which aims at clearness and brevity in definition, a valuable training is afforded the student by leading him to carefully weigh the definitions; to consider whether the definition can be curtailed without loss of clearness, or whether it be not already too brief to be intelligible; to consider whether it is too restricted or too extended in its application, etc.

With the view of emphasizing this important matter we shall call attention to some of the definitions in this book, and at the outset let us premise that the definitions of mathematical terms must conform to the usage of mathematicians. It is a well-known fact that certain features of text books, faults as well as excellencies, are faithfully reproduced. Witness the statement concerning the rotation period of one of the major planets, erroneously given in one of the earlier editions of "*Herschell's Outlines*," and this error faithfully copied into astrono-

mical text books for nearly half a century. Witness also those mathematical tables "independently computed for this work" containing errors identical with older tables. The definitions given by a professional teacher, whose knowledge is gained from and chiefly confined to text books, will therefore be found to differ from those of a mathematician, astronomer or physicist, whose conceptions are drawn from memoirs and documents differing radically from text books. If a mathematician, not a teacher, should write an algebra he would probably reflect usage of mathematical terms by mathematicians better than the teacher; at the same time the teacher might express himself with more clear conciseness and in a manner better adapted to the class room.

The differences pointed out above are illustrated in the work before us. A co-efficient is defined as a *known* factor, in accordance with the usual custom of defining it; it is certain that this restriction is not kept up even in algebraic text-books, as they speak of indeterminate (meaning undetermined) co-efficients. That the leading letters of the alphabet usually stand for known quantities is something which the student has to *un*learn as soon as he gets out of the elements, and often before, as is the case in this work when Interest, Annuities, etc., is reached. The statement (p. 27) that "it is usual to prefix to the parenthesis the sign of the first term that is to be enclosed within it," may be questioned.

"An equation" according to this book "is a statement that two expressions are equal." Suppose we make this statement: "One pound is equal to sixteen ounces," will not this conform to the definition and at the same time will it not fail to represent the algebraist's conception of an equation? According to the definition of "Equation of Condition" $x^2 =$ my is not an equation of condition. "To solve an equation is, to find *the* value of the unknown quantity," thus implying that there is but one value that will satisfy the equation, an impression that will subsequently require correction. The terms *cancel* and *reduce* so much used are not defined. The usage of the first is in accordance with general use but not in accordance with the usual definition. In fact no definition of it in any algebra (I am ready to be corrected) conforms to mathematical usage.

The definition of fraction is purely the arithmetical one in which the numerator and denominator are supposed to be integers and hence fails as a general definition, just as the definition of *index* or *exponent* fails through too great limitation or from tacitly assuming that a general symbol will only have special values.

In spite, however, of the points to which we have called attention above we consider this algebra a useful one. The numerous examples afford the student ample resources for getting practically familiar with algebraic manipulation, and the conspicuous absence of set rules compels the work to be done thoughtfully rather than by rule of thumb. Factoring, that important branch of algebra is fully treated, though the same can hardly be said of radicals. The chapter on logarithms is well done, much better than is common, and to our mind is decidedly the best chapter in the book. The book is well printed and attractive in appearance in spite of the lines at the top of the page and is very free from typographical errors. We have only noticed one, p. 349, Ex. 20, where $10 should read $5.

MARCUS BAKER.

U. S. COAST AND GEODETIC SURVEY OFFICE,
WASHINGTON, D. C., *August* 11, 1881.

METEOROLOGICAL REPORT FOR NEW YORK CITY FOR THE WEEK ENDING SEPT. 10, 1881.

Latitude 40° 45′ 58″ N.; Longitude 73° 57′ 58″ W.; height of instruments above the ground, 53 feet; above the sea, 97 feet; by self-recording instruments.

SEPTEMBER.	BAROMETER. MEAN FOR THE DAY. Reduced to Freezing.	BAROMETER. MAXIMUM. Reduced to Freezing.	BAROMETER. MAXIMUM. Time.	BAROMETER. MINIMUM. Reduced to Freezing.	BAROMETER. MINIMUM. Time.	THERMOMETERS. MEAN. Dry Bulb.	THERMOMETERS. MEAN. Wet Bulb.	THERMOMETERS. MAXIMUM. Dry Bulb.	THERMOMETERS. MAXIMUM. Time.	THERMOMETERS. MAXIMUM. Wet Bulb.	THERMOMETERS. MAXIMUM. Time.	THERMOMETERS. MINIMUM. Dry Bulb.	THERMOMETERS. MINIMUM. Time.	THERMOMETERS. MINIMUM. Wet Bulb.	THERMOMETERS. MINIMUM. Time.	MAXI'M In Sun.
Sunday, 4	30.008	30.032	12 p. m.	29.950	0 a. m	68.3	64.7	71	3 p. m.	66	3 p. m.	65	6 a. m.	62	6 a. m.	91.
Monday, 5	30.051	30.096	9 a. m.	30 008	6 p. m.	75.3	70.6	82	4 p. m.	75	4 p. m.	68	5 a. m.	66	5 a. m.	132.
Tuesday, 6	30.007	30.042	9 a. m.	29.988	4 p. m.	84.6	76.0	97	4 p. m.	81	4 p. m.	74	5 a. m.	72	5 a. m.	150.
Wednesday, 7	29.934	29.992	9 a. m.	29.894	5 p. m.	90.6	76.0	101	3 p. m.	83	6 p. m.	79	6 a. m.	73	6 a. m.	154.
Thursday, 8	30.031	30.088	9 p. m.	29.928	0 a. m.	79.0	71.3	89	2 p. m.	78	2 p. m.	69	12 p. m.	63	12 p. m.	133.
Friday, 9	30.003	30.082	0 a. m.	29.950	7 p. m.	73.3	68.0	78	4 p. m.	72	4 p. m.	68	5 a. m.	64	5 a. m.	96.
Saturday, 10	29.933	29.994	9 a. m.	29.900	12 p. m.	72.0	69.3	75	9 a. m.	71	9 a. m.	66	12 p. m.	65	12 p. m.	117.

		Dry.	Wet.
Mean for the week	29.995 inches.	77.6 degrees	70.8 degrees.
Maximum for the week at 9 a. m., Sept. 5th	30.096 "	101. " at 3 pm 7th,	83. " at 6 pm 7th,
Minimum " at 5 p. m., Sept. 7th	29.894 "	65. " at 6 am 4th,	62. " at 6 am 4th,
Range	.202 "	36. "	21. "

SEPTEMBER	WIND. DIRECTION. 7 a. m.	2 p. m.	9 p. m.	VELOCITY IN MILES. Distance for the Day.	FORCE IN LBS. PER SQR. FEET. Max.	Time.	HYGROMETER. FORCE OF VAPOR. 7 a. m.	2 p. m.	9 p. m.	RELATIVE HUMIDITY. 7 a. m.	2 p. m.	9 p. m.	CLOUDS. CLEAR, 0 OVERCAST. 10 7 a. m.	2 p. m.	9 p. m.	RAIN AND SNOW. DEPTH OF RAIN AND SNOW IN INCHES. Time of Beginning.	Time of Ending.	Duration. h. m.	Amount of water	OZONE. 0 10
Sunday, 4	s. e.	s.	s.	87	¾	11.30 pm	.516	.572	.599	83	75	84	8 cu.	9 cu.	9 cu.	-----	-----	-----	--	0
Monday, 5	s. w.	s.	s. s. w.	158	2½	0.50 am	.599	.717	.757	84	70	81	6 cu.	8 cu.	0	-----	-----	-----	--	0
Tuesday, 6	w. s w.	n. w.	s. w.	81	¾	5.30 pm	.757	.741	.850	90	46	68	10	3 cir. cu.	1 cir.cu.	-----	-----	-----	--	1
Wednesday, 7	w. s. w.	w. n.w.	w.	122	2½	2.00 pm	.717	.559	.827	70	28	57	1 cu.	4 cir. cu.	1 cir.	-----	-----	-----	--	6
Thursday, 8	n. n. w.	e. n. e.	e.	117	1¼	3.20 pm	.690	.809	.529	70	59	74	0	10	10	-----	-----	-----	--	1
Friday, 9	e. s. e.	s. s. e.	s. e.	63	¼	4.00 pm	.529	.625	.693	74	65	85	10	10	10	-----	-----	-----	--	0
Saturday, 10	s. e.	n. e.	n. e.	104	7	8.40 pm	.706	.704	.635	90	81	89	10	8 cu.	10	10⅓ am 4.40pm	11½ am 10 pm	1.00 5.20	.01 .08	9

Distance traveled during the week	732 miles.	Total amount of water for the week	.09 inch.
Maximum force	7 lbs.	Duration of rain	6 hours, 20 minutes.

DANIEL DRAPER, Ph. D.

Director Meteorological Observatory of the Department of Public Parks, New York.