some fields, gently sloping towards a depression in the middle, until we reach another little creek, flowing south into the Tohickon. The explanation of this seems to be as follows: Beaver Creek originally flowed out to the south-east, across the present divide, into the Tohickon, having a similar course to that of the Tohickon in that it crossed the strike of the beds. Tinicum Creek, gnawing along its easier path, reached and captured Beaver Creek, at the point where the sharp turn is seen. The divide which originally stood close to the Tinicum has now been pushed south until it occupies a position close to the letter *B* in the figure.

The beheaded portion of Beaver Creek still occupies the old valley, while an inverted stream now flows north in a directly opposite direction to that of the original Beaver Creek. The old valley across the divide to the Tohickon is seen as the gentle depression in the fields.

This explanation shows us why there is the sudden turn in the Tinicum just at this point. It has worked back on its easy course until it has captured Beaver Creek, and, as shown above, is continuing its work by pushing back towards the Tohickon, which it will very soon capture in the same way.

R. DeC. WARD.

Harvard College, Oct., 1891.

ASTRONOMICAL NOTES.

M. PALMIERI, director of the Vesuvian Observatory, is responsible for the statement that all the great eruptions of Vesuvius take place at new or full moon, and especially eclipses. The eclipse of June 17, 1890, was accompanied by violent earth currents. On the other hand, Captain de Montessus, who has patiently accumulated observations and data concerning earthquakes, has now a catalogue of more than 60,000 of these phenomena, individually discussed. He establishes that earthquakes are distributed uniformly throughout the day and night, that they have no relation to moon culminations and astronomical seasons, and that such coincidences which have been claimed in the past rest on insufficient ground.

M. Janssen, the eminent French astronomer, has been attempting to find solid rock on the top of Mount Blanc, upon which to build an observatory. His scheme has been to bore galleries through the ice, but so far he has been unsuccessful, and he is considering the feasibility of founding an observatory on the ice.

In the December number of *Knowledge* will be found reproductions of photographs, taken by Dr. Max Wolf of Heidelberg, of the region of the Milky Way in the constellation Cygnus, and also in the constellation Sagitarius. Mr. Ranyard, the editor of *Knowledge*, in an article entitled "Dark Structures in the Milky Way," calls attention to several interesting facts connected with the region of the heavens shown in the photographs. One of the regions covered is that surrounding Alpha Cygnus, and directly above that star is seen a dark, branching, tree-like structure. It evidently corresponds to a branching stream of matter which cuts out the light of the nebulous background on which it seems projected, and it is evidently intimately associated with the lines of stars which border the stream and its branches on either side. A somewhat similar dark branching stream may also be traced on a photograph of the region surrounding Epsilon Cygni, a copy of which appears in the October number of the journal above quoted. Altogether the article, with its attendant photographs, is very interesting, and brings to light some new facts connected with that region of the heavens in which the stars seem almost countless.

The small planet discovered by Dr. J. Palisa of Vienna, on Aug. 30 (now numbered 313), has been named Chaldea.

In a very interesting paper in No. 3,066 of the *Astronomische Nachrichten*, Professor Auwers gives the sun's parallax as 8.880″, with a probable error of ± 0.022″ This value is the result of the determination from the German Transit of Venus expeditions in 1874 and 1882, during which years 754 measurements were made. Professor Harkness, in his discussion of the results of the American Transit of Venus Commission, from the photographs alone, obtained the value 8.842″ for the sun's parallax, with a probable error of ± 0.011″. From a discussion of all the data obtainable, he obtained 8.80905″ ± 0.00567″. This latter value corresponds to a mean distance of 92,796,950 miles from the earth to the sun, while Professor Auwers's value corresponds to a distance of 91,814,000 miles.

The following is a continuation of the ephemeris of Winnecke's comet. The epoch is for Berlin midnight.

1892	R.A. h.	m.	s.	Dec. °	′
Jan. 12	12	28	12	+ 13	38
13		29	8	13	42
14		30	4	13	47
15		30	58	13	52
16		31	53	13	57
17		32	46	14	3
18		33	39	14	9
19		34	31	14	15
20		35	22	14	22
21	12	36	13	+ 14	28

The following is a continuation of the ephemeris of Wolf's comet. The epoch is for Berlin midnight.

1892	R.A. h.	m.	s.	Dec. °	′
Jan. 11	4	16	43	− 13	2
12		17	5	12	54
13		17	29	12	45
14		17	55	12	37
15		18	22	12	28
16		18	51	12	19
17		19	21	12	10
18		19	52	12	1
19		20	24	11	52
20		20	58	11	43
21	4	21	33	− 11	33

G. A. H.

THE GRADUATE STUDENTS' ASSOCIATION OF JOHNS HOPKINS.

THE *Johns Hopkins University Circular* for November gives the names of graduate students in that university from nearly every State in the Union. Nearly all the Canadian provinces and several foreign countries are represented. These three hundred students are here, primarily for hard work, each in his specialty, in one of fourteen departments. Not a few of the students enrolled last year are now studying in European universities, with the expectation of returning to their work here at the beginning of the next year.

There must be departmental isolation in every university, but this may become extreme. The best training for a capable and cultivated manhood can be obtained only as one mingles with his fellows and shares their varied experiences. An organization

which could furnish some tie of social solidarity between students while in residence here, and bring the men into easy communication with universities when abroad, has been lacking. This want, felt by the graduates and some members of the faculty, led to the formation, May 25, 1891, of the Graduate Students' Association. Similar associations have been formed in the universities of Edinburgh, Paris, and in other European universities.

The specific purposes of the association may be gathered from the resolutions passed at the first mass-meeting, from the constitution adopted Oct. 17, and from the reports of the various committees. All of these are freely used in the preparation of the present statement.

Any graduate student may become a member of the association on signing the constitution and paying a small annual fee.

The honorary members consist of the members of the faculty, all past members of the association, and of such distinguished men at home or abroad as may be elected to honorary membership at the yearly meeting of the association.

The functions of the association are comprised in the divisions: international, national, and local or social. The committee on international relations furnish students going abroad with letters of introduction to similar associations in foreign universities, and receive students with letters from like associations of foreign universities. National functions are carried out by a committee who strive to promote intercourse with colleges and universities in the United States and present the advantages of this university to students who contemplate graduate work. This committee has charge of university extension in Baltimore. The social committee receive new students, acquaint them with university methods and give other desired information. They are the medium for co-operation between the faculty and students. They secure any advantages in trade, and adopt such means as may be feasible to promote sociability among the students.

These and other constitutional provisions have been carried out during the present half-year as follows: —

A students' committee, consisting of one from each department, elected by the graduate students of the several departments, was chosen.

The student representatives of the respective departments are: astronomy, Brantz M. Roszel; chemistry, J. E. Gilpin; geology, Francis P. King; biology, R. G. Harrison; physics, George O. Squier; mathematics, E. P. Manning; English, F. J. Mather; history, J. A. James; German, Albert B. Faust; Greek, John H. T. Main; Latin, Sidney G. Stacey; Sanskrit, William W. Baden; romance languages, Julius Blume; Semitic languages, J. D. Prince; pathology, S. Flexner. This general committee, in pursuance of powers granted, elected the association officers and appointed sub-committees for the present year.

The following officers and sub-committees were elected: honorary president, Professor H. B. Adams; president, John H. T. Main; vice-president, W. I. Hull; secretary, R. G. Harrison; treasurer, T. S. Baker; committee on international relations, J. E. Blume, David Kinley, and F. J. Mather; committee on national relations, J. A. James, G. W. Smith, and W. H. Kilpatrick; committee on social relations, R. P. Bigelow, A. B. Faust, S. G. Stacey, U. S. Grant, and J. Blume.

The work accomplished by the committees, although a mere beginning, serves to show that the association has a valuable place in university life. Communication has been entered into with associations of foreign universities. Lectures and courses of lectures have been given by graduate students in the interest of churches and of city associations.

Dr. Walter B. Scaife, a former Hopkins student, by the invitation of Professor Adams, is to give for the benefit of the association an illustrated lecture on "Florence and the Florentines." This lecture is to be given in Levering Hall and followed by an assembly in the parlors. This meeting will be the first of a series of social gatherings to take place during the year.

Through these means it is believed that departmental isolation will be overcome; that men may, through this association, enter into a broader student life, and that the university at large will be convinced of the need for wider social relations than are found in the laboratory or seminary.

JOHNS HOPKINS MARINE LABORATORY.

THE following report of the 1891 session of the Marine Zoological Laboratory has just been made to the president of the Johns Hopkins University.

Early in May, 1891, some of the members of our party went to Jamaica, which had been selected as our field of work for the season, while others joined us later on.

Our party was as follows: W. K. Brooks, director; E. A. Andrews, associate in biology; R. P. Bigelow, graduate student in biology; J. P. Campbell, professor of biology, Athens, Georgia; G. W. Field, graduate student in biology; J. C. Gifford, special student in pathology; R. G. Harrison, H. M. Knower, and M. M. Metcalf, graduate students in biology; T. H. Morgan, Adam T. Bruce fellow; G. C. Price, graduate student in biology; John Stuart, teacher of science, Hope School, Jamaica; Charles Taylor, Kingston, Jamaica; B. W. Barton, lecturer in botany; Basil Sollers, teacher, Baltimore. The two last named devoted themselves to botanical exploration and study in the interior of the island, and they did not visit the laboratory at the seashore.

After a preliminary exploration of different seaports, we selected Port Henderson as our station. This is a seaside resort in Kingston Harbor, opposite Port Royal, and about nine miles by water from Kingston. Here we found two partially furnished houses suitable for a laboratory and lodgings, and we rented and occupied them for about fourteen weeks, from May 26 to Sept. 1.

The establishment of a party in a new home at a remote point in a strange country is a task which, in the mid-summer climate of the tropics, is most severe and exhausting. Of this, I was entirely relieved by Dr. Morgan and Mr. Bigelow, who themselves attended to all the preliminary work with great efficiency, and I take this opportunity to thank them for their willing help, which contributed in no small degree to the success of our expedition.

Our summer was devoted, in great part, to the collection and preservation of material for embryological work at home, and, as the members of the party are still employed in preparing and studying it, the results are not yet far enough advanced for reporting. There are a few noteworthy points of interest, however. Among them are the following: —

Soon after we settled at Port Henderson, Mr. Field found near our laboratory, in an enclosed lagoon of dense salt water, a very remarkable rhizostomatous medusa belonging to the genus Cassiopea. No special of this genus, as limited by Haeckel, has heretofore been found anywhere in the Atlantic. It is a South Pacific form, and the known species are from this region or from the Indian Ocean and the Red Sea. A species of a closely related genus, Polyclonia frondosa, was found by L. Agassiz on the coast of Florida, and was referred by him to the genus Cassiopea, although it is not a true Cassiopea. Polyclonia frondosa is found in Jamaica also, and we obtained specimens in Port Royal Harbor. It is also found in the Bahamas, and Professor H. V. Wilson has given to me the notes and drawings which he made from specimens which he obtained at Green Turtle Kay.

The medusa which we found at Port Henderson is not a Polyclonia, but a true Cassiopea, and the only one as yet found in the Atlantic. As it is very abundant and conspicuous, its escape from the notice of naturalists for such a long time is remarkable, for it is so well known to the negro fishermen of Jamaica that they have a name for it — the Guinea corn blubber. As it is one of the most common and characteristic marine animals of these waters, I have proposed to call it, after the Indian name of the island, Cassiopea Xamacha. While it is able to swim slowly by the pulsations of its bell, it is usually found fixed upon the smooth chalky bottom by the flat sucker-like surface of its exumbrella, and in some places the bottom was so completely covered with them that their circular discs were actually touching each other, while the interspaces were filled in by smaller specimens.

Our knowledge of the life history of the rhizostomatous medusæ is very incomplete, and is based entirely upon the study of the Mediterranean *Colytorhiza tuberculata*, a species which belongs to a more specialized division of the group than Cassiopea, although it was formerly called Cassiopea Borbonica. Many fundamental points in the development of the rhizostomes, and, in