the sun to these distant mirrors and thence to the earth, and to correct the dates of the observations of Stebbins and his colleague to correspond with the dates of observation of the solar constant, by allowing for the time intervals required for the sun to rotate from the direction of the satellites and the planet to the direction of the earth.

The Lick observations are published as departures in stellar magnitudes from the mean brightness of the objects during the whole interval of observation. The solar constant measures at Mount Montezuma are given in calories per square centimeter per minute. I have reduced all these results from both stations to the corresponding condition of percentage departures from the mean values prevailing during the periods of observation. To avoid repetition of useless figures, I express these departures in tenths of a per cent.

It will be noted that the range of departures for the solar constant scarcely exceeds 1 per cent., while the range of the photoelectric measurements is somewhat greater. Stebbins and Jacobson decided that the measurements on Uranus in 1927 have greater weight than those on the satellites, as is indeed indicated by their smaller range.

The solar constant values as here employed are all reduced by the definitive method in which every known source of error has been eliminated, including systematic errors requiring several years of observation for their determination. They are as accurate, we think, as can ever be obtained.

On the whole, there is agreement on both sides that the short-interval solar variations during these periods were very minute. As the photoelectric measurements are not quite equal in accuracy to the solar constant measurements, it is not possible to be sure whether they really support one another in singling out any of the apparent minute solar variations as real. The agreement between Montezuma and Uranus from July 27 to August 10, 1927, is very close, but reveals no considerable solar changes. During the interval from August 19 to August 31, when Montezuma seems to indicate a range of 1 per cent. very consistently, the agreement, otherwise close, is marred by four considerable departures.

OBSERVATIONS OF 1927

| Dates Lick | | | Departures: Tenths per cent. | | | Differences—Montezuma from Lick | |
|---|---|---|---|---|---|---|---|
| Montezuma | Satellites | Uranus | Montezuma | Satellites | Uranus | Satellites | Uranus |
| July | July | | | | | | |
| 27 | 24 | 23 | +2 | − 4 | − 1 | 6 | 3 |
| 28 | 25 | 24 | +1 | −24 | − 2 | 25 | 3 |
| 29 | 26 | 25 | −3 | − 8 | − 2 | 5 | 1 |
| 30 | 27 | 26 | +1 | −10 | − 4 | 11 | 5 |
| 31 | 28 | 27 | 0 | ..... | − 1 | 3 | 1 |
| 32 | 29 | 28 | −1 | − 4 | − 1 | 3 | 0 |
| 33 | 30 | 29 | +1 | − 2 | − 1 | 1 | 2 |
| 34 | 31 | 30 | −1 | − 2 | 0 | 3 | 1 |
| 35 | 32 | 31 | −1 | + 2 | 0 | ..... | 1 |
| August | August | | | | | | |
| 5 | 2 | 1 | 0 | + 6 | − 2 | 6 | 2 |
| 6 | 3 | 2 | 0 | − 6 | − 2 | 6 | 2 |
| 7 | 4 | 3 | +1 | ..... | − 2 | ..... | 3 |
| 9 | 6 | 5 | −2 | −13 | − 2 | 11 | 0 |
| 10 | 7 | 6, 7 | −1 | − 1 | − 1 | 0 | 0 |
| 11 | 9 | 8 | −5 | + 4 | 0 | 9 | 5 |
| 14 | 12 | 11 | −2 | ..... | + 4 | ..... | 6 |
| 17 | 15 | 14 | 0 | + 4 | +10 | 4 | 10 |
| 18 | 16 | 15 | +2 | − 1 | +11 | 3 | 9 |
| 19 | 17 | 16 | −5 | + 6 | − 3 | 11 | 2 |
| 20 | 18 | 17 | −1 | +11 | − 9 | 12 | 8 |
| 21 | 19 | 18, 19 | −6 | +10 | + 4 | 16 | 10 |
| 22 | 21 | 20 | −4 | − 1 | + 9 | 3 | 13 |
| 23 | 22 | 21 | −5 | + 2 | − 6 | 7 | 1 |
| 24 | 23 | 22 | −4 | − 4 | + 1 | 0 | 5 |
| 26 | 25 | 24 | −2 | ..... | +11 | ..... | 13 |
| 28 | 27 | 26 | −2 | ..... | − 2 | ..... | 0 |
| 31 | 30 | 29 | +5 | ..... | + 6 | ..... | 1 |
| Sept. | Sept. | | | | | | |
| 3 | 3 | 2 | 0 | ..... | + 6 | ..... | 6 |
| 6 | 6 | 5 | 0 | −20 | − 4 | 20 | 4 |
| 19 | 19 | 19 | 0 | 0 | + 4 | 0 | 4 |
| 20 | 20 | 20 | +1 | ..... | − 3 | ..... | 4 |
| 21 | 21 | 21 | +5 | − 2 | − 2 | 7 | 7 |
| 22 | 22 | 22 | 0 | ..... | − 6 | ..... | 6 |
| 23 | 23 | 23 | +3 | − 2 | − 4 | 5 | 7 |
| 24 | 24 | 24 | +2 | 0 | + 5 | 2 | 3 |
| 29 | 29 | 29 | −1 | − 2 | − 2 | 1 | 1 |
| Means: | | | 2 | 6 | 4 | 7 | 4 |

It will be noted that the range of departures for the solar constant scarcely exceeds 1 per cent., while the range of the photoelectric measurements is somewhat greater. Stebbins and Jacobson decided that the measurements on Uranus in 1927 have greater weight than those on the satellites, as is indeed indicated by their smaller range.

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C. G. ABBOT

SMITHSONIAN INSTITUTION

## SOCIETIES AND ACADEMIES

### THE NORTH CAROLINA ACADEMY OF SCIENCE

THE twenty-seventh annual meeting of the North Carolina Academy of Science was held at the University of North Carolina, Chapel Hill, N. C., on April 27 and 28, 1928. Papers were presented before the general section of the academy on Friday morning and afternoon. Friday evening the retiring president, Dr. J. M. Bell, gave his presidential address on "Some Approaches to Fundamental Theory of the Physical Sciences." Saturday morning the academy met in the following sections: General section, chemical section, mathematics section and physics section. Seventy-nine papers and five exhibits were on the program (abstracts of most of these papers and complete papers of several will appear in an early num-

ber of the *Journal of the Elisha Mitchell Scientific Society*).

The executive committee reported the election of fifty-seven new members during the year and the reinstatement of eight former members. One hundred and sixty-five were present for the meeting.

Mr. H. E. Biggs, Jr., a student in the Greensboro high school, was declared the winner of the high school science prize, a silver loving cup, for the best essay submitted by a high-school student. (Essays for 1928 were confined to the fields of chemistry and physics).

The officers elected for the year 1929 were:

GENERAL ACADEMY

*President,* J. S. Holmes, state forester.

*Vice President,* Miss Mary Petty, North Carolina Woman's College.

*Secretary and treasurer,* H. R. Totten, University of North Carolina.

*Executive committee,* The above officers and J. W. Nowell, Wake Forest College; A. H. Patterson, University of North Carolina; and F. A. Wolf, Duke University.

*Representative* to the A. A. A. S., Bert Cunningham, Duke University.

CHEMICAL SECTION

*Chairman,* L. G. Willis, State College.

*Secretary,* L. B. Rhodes, State Department of Agriculture.

*Councillor,* A. S. Wheeler, University of North Carolina.

MATHEMATICS SECTION

*Chairman,* J. W. Lasley, Jr., University of North Carolina.

*Secretary,* W. W. Elliott, Duke University.

PHYSICS SECTION

*Chairman,* W. T. Wright, North Carolina Woman's College.

*Secretary,* C. C. Hatley, Duke University.

The twenty-eighth annual meeting of the Academy will be held at the North Carolina Woman's College, Greensboro, N. C., in the spring of 1929.

H. R. TOTTEN,
*Secretary*

## THE KANSAS ACADEMY OF SCIENCE

THE sixtieth annual meeting of the Kansas Academy of Science was held at the Municipal University of Wichita, with one session at the Wichita High School, April 13 and 14, 1928. Two sessions on the first day and the forenoon of the second day were devoted to the presentation of papers and to business.

Dr. H. W. Foght, president of the university, gave a short address of welcome. The Wichita Chamber of Commerce sponsored a trip to the airplane factory. Following a banquet at the University cafeteria in the evening of April 13, the annual presidential address of the academy was given by Dr. Mary T. Harman, of the Kansas State Agricultural College. The subject of her address was "The Physical Unit of Life."

Officers were elected as follows:

L. D. Wooster, *president,* Hays State Teachers College.

W. B. Wilson, *first vice-president,* Ottawa University.

Hazel E. Branch, *second vice-president,* Municipal University of Wichita.

L. D. Havenhill, *treasurer,* University of Kansas.

G. E. Johnson, *secretary,* Kansas State Agricultural College.

Additional members of the executive council: E. O. Deere, E. A. White, F. C. Gates, Mary T. Harman.

Thirty-two papers were presented.

The Kansas Entomological Society met on April 14 in conjunction with and became affiliated with the academy.

The academy will meet at the Kansas State Agricultural College at Manhattan in 1929.

GEORGE E. JOHNSON,
*Secretary.*

## THE INDIANA ACADEMY OF SCIENCE

THE spring meeting of the Indiana Academy of Science was held at Logansport, Indiana, on May 17, 18 and 19, with over one hundred members in attendance.

The area along the Wabash and Eel Rivers in this region is a particularly good one for the study of the Silurian stratigraphy and associated coral reefs.

Auto tours in all directions from Logansport gave botanists, zoologists as well as the geologists, ample opportunity for studying the subjects in which they were interested.

Dr. E. R. Cummings and Mr. Robert Schrock, of Indiana University, who have made a special study of the area, acted as guides and explained the geological features.

Dr. Ernest Carman and Dr. Paris Stockdale, of the department of geology of Ohio State University, attended the meeting.

The program committee consisted of Dr. Paul Weatherwax, of Indiana University, *chairman,* assisted by Drs. C. L. Malott, of Indiana University; E. B. Mains, of Purdue University; and W. M. Blanchard, of De Pauw University.

HARRY F. DIETZ,
*Press Secretary*