will include a professor, an assistant, technician and clerical assistants. According to the dean, the new department "promises to greatly enhance the usefulness of the college of medicine in scientific and clinical medical fields." The college of medicine is the oldest unit of the Ohio State University.

THE New York *Times* writes editorially as follows: "To further the interests and usefulness of science the Association of Scientific Workers was organized in Great Britain two years ago. Small though it be, the association has made its influence felt on both Lords and Commons. Major Arthur Church, its energetic secretary and a doctor of science himself, stood for the House, was elected and promptly proceeded to organize no fewer than seventy of his fellow-members into what is merely the nucleus of a parliamentary science committee through which the association will endeavor to apply science in the service of the empire. Far from being an upstart, the parliamentary science committee, like most things British, has a respectable ancestry. Until 1866 the British Association for the Advancement of Science championed the cause of the physicist, biologist and chemist through a small parliamentary committee and thus succeeded in improving navigation and the weather-forecasting service; determining the conditions under which civil list pensions were to be awarded to scientists; raising the standard of scientific teaching; furthering the exploration of Africa by Livingstone, Speke and Grant, and inducing Tyndall and Huxley to express their opinions on the best method of introducing physical science into the curricula of the public schools. The example thus set may well be considered by Congress and American men of science. No government in the world conducts so much industrial and purely scientific research, through its bureaus, as ours. Yet the scientist plays no conspicuous part in our legislative halls."

DISCUSSION

THE PROPORTIONS OF THE GREAT PYRAMID OF GIZEH

IN a recent most interesting address on "Mathematics before the Greeks,"[1] Professor Archibald incidentally enumerates various "mystical" interpretations of the proportions of the Great Pyramid. This reminded me of an explanation suggested by the photograph which hangs before me in my office.

Whatever the reason for the choice of dimensions, the proportions seem artistically perfect. Is this a delusion due to familiarity or is there a mathematical basis for such a conclusion?

The apparent angle φ between the opposite inclined edges of a pyramid varies, as the spectator travels around the pyramid, from $2\tan^{-1}(d/h)$ to $2\tan^{-1}(.707\ d/h)$, where h is the height and d is half the diagonal of the base. Now the dimensions of the Great Pyramid are such that the ratio of the apparent width of the base ($2d\cos\theta$) to the height varies from a maximum of 2.222 to a minimum of 1.572. If these values are plotted as a function of the angle θ, the average value is exactly 2, which is the value which corresponds to a right triangle. This means that if the pyramid were rotated in front of a distant observer, the apparent angle between the opposite edges at the apex would vary between 96° and 76.3°, but the average value would be the angle 90°. This follows mathematically from the fact that the ratio of h (481 feet) to d (534.4 feet) is exactly the ratio of $\sin\pi/4$ to $\pi/4$, that is 0.900.

Now let us consider the vertical section of the pyramid perpendicular to two faces, the section any architect would draw. According to the Encyclopaedia Britannica, the angle between each face and the base has the following values, for the four pyramids of Medum and Gizeh.

	Name	King	Angle
1.	Medum	Sneferu	51° 52′
2.	Great Pyramid of Gizeh	Khufu	51° 52′
3.	Second " " "	Khafra	53° 10′
4.	Upper " " "	Menkaura	51° 10′

Why did the architect in each case choose an angle of about 52° instead of 45° or 60°? It is an interesting fact that for a right triangle having a lower angle of 51° 49.6′, the height is the geometric mean between the base and the hypothenuse, that is, the ratio of hypothenuse to height is equal to the ratio of height to base, giving a right triangle with perfect proportions. In the case of the first two pyramids the angle approximates this ideal angle within one part in a thousand. However, the fact that the third and fourth pyramids depart from this angle, one being slightly more and the other slightly less, suggests that the design was not controlled entirely by a mathematical formula, but was subject to modification according to artistic judgment, which, however, oscillated about the value given by the formula.

GORDON S. FULCHER

CORNING GLASS WORKS

THE NEW MADRID EARTHQUAKE—AN UNPUBLISHED CONTEMPORANEOUS ACCOUNT

I RECENTLY came upon the following record of observations of the New Madrid earthquake in an old

[1] SCIENCE, 71: 115, January 31, 1930.

journal in my possession of my great-grandfather, William Brown. The observations were made by him at his home three miles north of Hodgenville, Kentucky, and forty-six miles directly south of Louisville. This location was 225 miles slightly north of east of New Madrid. He has left numerous records in this journal, some of which have been published, that indicate the accuracy of his observations and records. The notes of the earthquake seem worthy of publication because accurate records of it made at the time are few and unexcited ones very rare.

Mount Gilead Kentucky Earthquake on Sunday night Decr. 15th, 2 of the clock at night a severe shock of an earth quake was felt. The motion of shaking continued about 15 minutes. About half an hour after this shock was over another was felt less severe, continued only a minute or two. The next day, Monday morning the 16th, a little after sun rise another shock was felt, the tremor continued a few minutes. Two other slight shocks were felt that morning—the next shock was on Sunday about midday not so violent as the first. The weather for some days before had been dull and cloudy. Again on the night of the 30th instant a shock was felt. Again on Jany (Thursday) 23 1812 at 8 o'clock in the morning another severe shock was felt. The tremor continued for several minutes. When it had stilled another shock was felt which lasted a minute or two. On Monday morning Jany. 27th, a slight shock was felt—on Tuesday evening, 4th Feby 1812 a slight shock was felt. The trembling of the earth continued for several minutes suppd. 6 or 7—and a rumbling noise heard. These are the shocks that we have felt at this place. By report hardly a day passes but the trembling of the Earth is more or less felt. In time of the severest shocks to attempt to walk you feel light head and reel about like a drunken man. Again on the night of Thursday, the 6th Feby. about 4 o'clock A. M. a very severe shock was felt which lasted fully 15 minutes with a rumbling noise like distant thunder and three very distinct reports like cannon was heard at the end of it. Again on Friday night the 7th a smart shock at 8 o'clock then about 11 o'clock another less severe. Frequently you may feel a trembling in the Earth when there is no visible appearance of shaking. It has invariably been cloudy weather about the time of the shocks and rains or snow shortly after. Again on the night 20th Feb. about 9 or 10 o'clock 2 slight shocks were felt the last of which continued its tremor for more than 15 minutes. Again on Saturday night 22d about 10 o'clock another slight shock.[1]

There are not many contemporaneous accounts. Fuller republished in SCIENCE[2] most of Audubon's account in his "Journal." It was written two or three years after the occurrence and is inaccurate; he puts the date a year after it occurred, and the first shock as occurring in the afternoon while he was riding. Bradbury, the British botanist, happened to be at the very center of the disturbance, on the Mississippi River, and describes it carefully in his "Travels in the Interior of America." Bradbury was a trained scientific observer and, as might be expected, his account is the most valuable. In the *American Geologist*,[3] Broadhead brings together most or all of the other early accounts that have been published. Of these, the account of Eliza Bryan, of New Madrid, taken down four and one half years later by Lorenzo Dow, is the only one that is free from excitement and gives a chronological account of the shocks. Brown's record of the repeated shocks agrees closely with those of Bradbury and Bryan and is the only one that is equally temperate and detailed.

Bradbury mentions the previous appearance of a comet in the following words: "One of the men . . . attributed it to the comet that had appeared a few months before, which he described as having two horns."

Brown also refers to this comet in the note next preceding that of the earthquake in his journal as follows:

A comet with a broomy tail appeared about the first week in September 1811 in the northern region of the Heavens. Its course appeared to be coming from the Northeast and making its way to the Southwest. Continued to be visible until about middle of Jany 1812. The last appearance of it was in the So. Western region of the Heavens.

It is evidence of his freedom from superstition that he does not suggest any connection between the comet and the earthquake.

WM. ALLEN PUSEY

BIOLOGICAL NOMENCLATURE

IN the issue of SCIENCE of January 10, Professor Needham renews, without enthusiasm, his proposal of 1910 of a system of numbering species in lieu of naming them. One serious objection to that plan is that it is much easier to remember names than numbers, and easier to associate names with species than to associate numbers with species. In a magazine article or an address to biologists most of them might recognize names of species, but few would recognize numbers. Furthermore, it is much more difficult to avoid mistakes in writing and printing names than in writing or printing numbers. A mistake in a figure makes the whole number wrong. A mistake in spelling a name may leave the meaning perfectly clear. In proof-reading a mistake in a number may be easily overlooked, whereas a misspelled name is likely to be noticed.

[1] From Wm. Brown's "Journal," pp. 19 and 20, in University of Chicago Library.

[2] May 12, 1905, N. S. XXI, No. 541.

[3] Vol. 30, August, 1902.