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## REVIEWS AND OPINIONS

### UNIVERSITIES

Owen Gingerich  
SMITHSONIAN ASTROPHYSICAL OBSERVATORY,  
HARVARD UNIVERSITY, U.S.A.  
(Part of an article as published in "Sky and Telescope")

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... "Ingeniously engineered and constructed in Western Germany, this unit is without doubt the most sophisticated tellurion ever made available on a mass-produced basis."

... "The Baader instrument's most novel contribution and single most spectacular effect has been achieved by enclosing the tellurion within a semiopaque plastic shell, representing the celestial sphere. The motorized solar machine is readily viewed through the near side of the plastic shell; but the near and far sides combined appear virtually opaque, thus giving the remarkable effect of a darkened hemispherical canopy of stars regardless of the direction from which the mechanism is examined."

... "With careful handling I am sure that the Baader Planetarium will give many years of useful service in my natural science classes at Harvard University."

Prof. Dr. Wolfgang Gleissberg  
ASTRONOMICAL INSTITUTE  
OF THE JOHANN-WOLFGANG-GOETHE UNIVERSITY  
FRANKFURT/M.

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"The rapid progress being made in space exploration is responsible for the fact that more and more general interest and attention is being paid to that time-honoured science dealing with space-astronomy. The number of people who feel a need to get to know something of what is happening in the cosmos is constantly growing as a result, and books, journals and lectures on the subject are being received with increasing enthusiasm. Experience shows, however, that written or oral information and explanations, as well as pictures and diagrams, are incapable of providing an adequate idea of the processes taking place in the universe. The difficulty which manifests itself here, that of being able to gain an accurate impression of the movements of the heavenly bodies through space with the aid of the imagination alone, represents a serious obstacle.

An excellent aid as a means of overcoming such difficulties is the BAADER PLANETARIUM. With its help, anyone working at schools or universities who is trying to make his pupils or audience familiar with the fundamentals of astronomy, will find it easy and even more difficult to grasp. As examples, I would mention: The inter-relationship of the daily rotation of the Earth and Earth's equator and the celestial equator, between the Earth's orbit and ecliptic, the variations in the visibility of the constellations throughout the course of a year, the difference between sidereal day and solar day, the causation of the seasons and the phases of the moon, the apparent orbits of the Sun and the Moon, the conditions that

are necessary for the occurrence of the eclipses of the Sun and the Moon, the course of the nodes of the Moon's orbit, the actual and apparent movements of an artificial earth satellite.

It is, of course, unavoidable that the construction of the BAADER PLANETARIUM necessarily involves a deviation in certain dimensional relationships from the ones actually pertaining in the universe, and one cannot simulate every cosmic movement with this aid. It must however be said that the educational value of the BAADER PLANETARIUM is not confined to making visually clear to the pupils and the students the motions which can actually be demonstrated; rather, its regular use in lessons on astronomy ideally promotes the development of the pupil's ability to appreciate motions in space to such an extent that he is more readily able to grasp and understand the implications of the movements of the heavenly bodies which cannot be demonstrated directly. For this reason, the BAADER PLANETARIUM should not fail to be available in elementary schools, intermediate schools, high schools and university extension schools."

Prof. Dr. H. Haffner  
ASTRONOMICAL INSTITUTE  
OF THE UNIVERSITY OF WÜRZBURG  
(Long-standing Chairman of the "Astronomische Gesellschaft")

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"At present there are about 2.000 BAADER PLANETARIA distributed throughout the Federal Republic of Germany. This figure is extremely low since it would be most desirable that this device be used by every elementary school, every secondary school and every grammar school as an educational aid. There is no other device presently available, with the aid of which the events in the heavens can be explained and made clear in such a simple and direct manner. "

Prof. Dr. Felix Schmeidler  
UNIVERSITY OF MUNICH  
Faculty of Natural Sciences

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"It is my considered opinion that the BAADER PLANETARIUM is of immense educational value. Since it is always difficult to imagine and to grasp the orbital motions of the heavenly bodies, the model that can be demonstrated by this device is extremely useful.

Of course, nobody can expect from such an instrument that the representation be exactly true-to-scale since, on account of the tremendous dimension of the planetary system, this would not be technically possible. Thus, for example, when the Earth's year has only 12 instead of 365 days, this is merely one of the numerous compromises that simply have to be made for such representations. With the aid of this device, an understanding of the most important astronomical phenomena can be mediated in an excellent manner. As examples I would mention the difference between solar day and sidereal day, eclipses, the position of the orbit of an artificial satellite and the causation of the seasons. All these phenomena, and many more, can be demonstrated with this device so clearly that the observer really gains an excellent three-dimensional picture of what is happening in the planetary system. I was able to verify the accuracy of the movements represented in a number of demonstrations and have found, with the exception of the modified scale previously mentioned, no mis-representation of the actual astronomical facts.

I was particularly pleased by the adhesive foils representing the outlines of the historical constellations. Although these constellations are no longer used as scientific terms, I still think it a good thing that it is possible with the aid of this device to reconstruct these historical outlines. This possibility will make it easier for many people who look at the skies with different eyes from those of astronomers to become familiar with the stars.

It is my opinion that the instrument might well be eminently suitable as an aid in the instruction of the populace at large in astronomical matters. I hope that it will become as widespread as possible and thus help to improve the image of the science of astronomy."

## SCHOOLS

Prof. Fritz Voit,  
High School Ingolstadt  
(published in "Praxis der Naturwissenschaften")

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"It is not easy to give the pupil a good idea of the movements carried out by the heavenly bodies. In order to be able to do so, the teachers need models such as a celestial globe, and a tellurion. For the pupil it is certainly difficult to translate the appearance of the celestial globe to the actual appearance of the heavens, an ideal aid in this connection would be a Zeiss Planetarium - which, of course, is far too expensive for the normal school. The tellurion alone demonstrates the course of the Earth's motion and that of the Moon's around the Sun, but does not relate these movements to the cosmos, so that the pupil again obtains only an incomplete picture. The BAADER PLANE TARIUM has, for the first time, successfully combined both - a tellurion and a planetarium and thus provides the teacher with an excellent teaching aid.

The teacher can now take advantage of the unique features of this device. Through the plexiglass the observer sees the opposite inside of the globe in deep black with the stars of the night sky and the milky way shining white. In this night-black space, the Earth circles round the Sun. Not even a large planetarium is able to provide such an impression of vivid plasticity! The free movement of the entire globe is also well thought-out: When the observer looks at the Earth and the Moon from the northern celestial pole, the rotation is in a counter-clockwise direction; if the entire globe is now turned around, he can immediately see that the direction of movement now reverses for every point on the southern hemisphere of our Earth.

If the "solar sphere" is removed, the stars can be projected onto the ceiling or walls of the lecture room with the aid of a spot-lighting lamp. Of course, distortions occur (the teacher can indicate what happens when a spherical surface is projected onto a plane surface). Transparent foils bearing the symbolic constellations are provided with the device and can be applied to the globe and projected.

This brief review doesn't of course give enough scope to mention all the possibilities offered by the BAADER PLANETARIUM. It can, however, be stated that it is a new and quite excellent educational aid that can be bought for a moderate price. The amateur astronomer, too, would enthusiastically receive and profit from the instrument."

K. Schwalbe,  
Secondary School Teacher  
Secondary School Velbert in the Rhineland  
(published in "Allgemeine Deutsche Lehrerzeitung")

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"The BAADER PLANETARIUM is a completely new form of educational aid intended to present a three-dimensional picture of the phenomena of the heavens. The planetarium is so ingeniously designed and well thought-out that almost all the phenomena belonging in this sector can be demonstrated in an easy-to-follow manner. The main parts of the device are a freely rotatable celestial globe made of plexiglass which is separable into two hemispheres and which is mounted on a base, and a tellurion built into the globe. The plexiglass globe (diameter 50 cm) is so coloured that, when it is looked at in light from the outside, it appears completely black and can thus be used as a celestial globe. If, in a darkened room, the "Sun" inside the globe is illuminated, we can look into the globe but not right through it. Thus, we can see the vault of the heavens in its "natural curvature" and the constellations are seen as they naturally appear to us. This is unique.

This small miracle of precision engineering, enables the representation of all such celestial phenomena as: day and night, the seasons, the phases of the Moon, eclipses. The external planet orbits are impressed on the inside of the globe. The fascinating thing about this device is that all the events take place before the firmament, so that a three-dimensional observation of the phenomena is possible. This seems to me to be particularly important for the use of the BAADER PLANETARIUM in the classroom. Of course, it goes without saying that the dimensions of the device do not allow a true-to-scale representation. In addition to these fundamental phenomena, the planetarium offers deeper

insights into astronomical events, for example, sidereal day and solar day, the Platonic year, the wanderings of the circumpolar stars, demonstration of how the celestial phenomena appear to an observer on the southern hemisphere of the Earth, etc., etc.. On account of its versatility, this instrument is a valuable and desirable teaching aid for all the different types of school and for astronomy study groups in schools and colleges.”

W. Renkawitz,  
Headmaster Elementary School Rodenkirchen,  
District of Cologne

(published in the journal “Zeitschrift für Naturlehre und Naturkunde”)

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“In the science of astronomy, what appears to be does not always correspond with what actually is. Apart from this, the study of the heavens is not “graspable”, since we are dealing with magnitudes far beyond our daily experience. The usual aids can thus demonstrate this or that point while remaining inadequate for other phenomena.

Now we have a new demonstration device available, the BAADER PLANETARIUM, which offers such a large number of possibilities that they will scarcely ever be exhausted. It is impossible to list all the things that can be demonstrated with this new device. It's great practical value lays in the fact that the causation of all the many phenomena associated with the Earth as a heavenly body can be shown. The planetarium enables things to be seen in three dimensions, either from "outside" or, with the exercise of a little imagination, from the Earth itself.

The program is extensive. The size of the planetarium makes it possible to use it at the front of the class. When a particular problem is to be discussed, however, it is advisable to have a smaller group of pupils seated round the device. Since damage is virtually impossible (even the two hemispheres are almost indestructable), and the operation is so simple, the planetarium is well suited for use in group teaching.

Here is a device which, on account of its versatility, should most definitely find a permanent place in the classroom. Moreover, as a closed globe or as an open hemisphere, this device is a fine ornament for any part of the school.”

## **GEOGRAPHY**

K. Thorn,  
Geographer Munich  
(published in “Geographische Rundschau”)

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“The device can be used on its own to do the same as three different conventional instruments in the same field, viz:

1. a celestial globe
2. a planetarium (in the reduced sense of the word)
3. a tellurion

... In incident light, however, (when in a darkened room the “Sun” has been turned on), the side of the celestial globe that is nearest to the observer is completely transparent and he can see the Earth and its Moon orbiting around the Sun before a backdrop of stars which he sees, as in a full-scale planetarium, as if observing them in actual fact. This aspect is really amazing - the observer enjoys the illusion of looking at the solar system from a point deeper in space.

The necessary compromise between vivid plasticity and the retention of proportions has, in my opinion, been optimally achieved: The differences in the orbital diameters are unimportant, and the fact that the Earth revolves only 12 times round its axis while orbiting round the sun would seem favourable rather than unfavourable, since many phenomena can be shown more clearly and with a saving of time.”