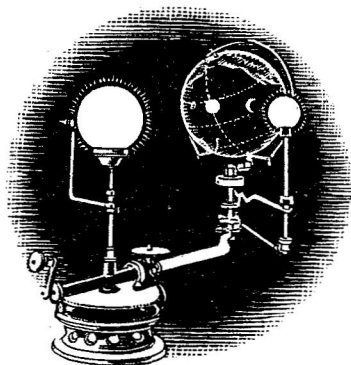


*Frustration changed to Fascination both for Teacher and Pupil*



# PEERLESS PLANETARIUM C O M P A N Y · L I M I T E D

*121 Front Street West  
Toronto, Ontario, Canada*

PHONE ELGIN 1846

The

Peerless Planetarium  
or Films are unex-  
celled for the visual  
teaching of

**GEOGRAPHY**  
**PHYSIOGRAPHY**  
**CLIMATOLOGY**  
**METEOROLOGY**  
**ASTRONOMY**

and

the inter-relations of  
all these subjects  
including History and  
Social Science.

●  
Slow, Complex, and  
"Difficult," Subjects  
become Quick, Easy,  
Interesting and  
Fascinating

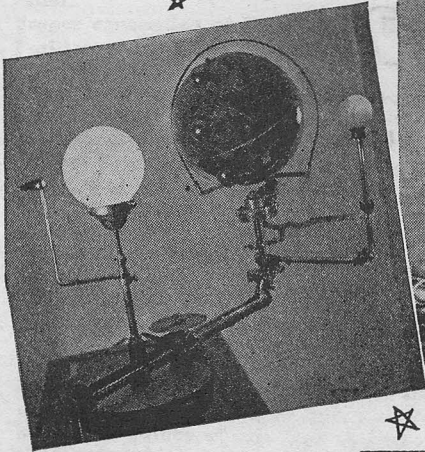
●  
For

Scope and Unqualified  
Commendation by Highest  
Authorities, see page four.

*Action! Attraction! Illumination! Visualization! Simplification!*

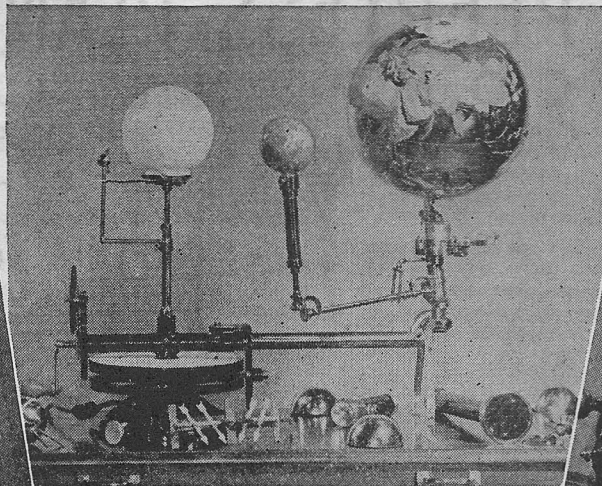
# Peerless Planetarium

## WITH EQUIPMENT AND APPARATUS

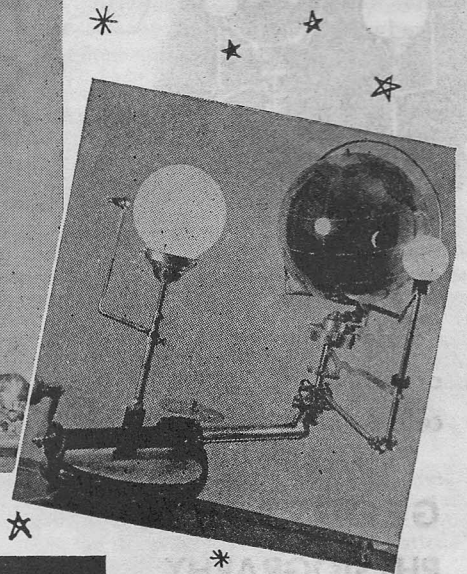


THE REFLECTION OF SUN'S IMAGE ON 3 SMALL HEMISPHERES attached to Earth's surface—the moving image shows sun actually rising from horizon to zenith and setting back to opposite horizon again—thus actually showing the course and cause of longer and shorter days and nights at any place and at any time of year.

COMMANDER OF NAVAL DISTRICT—and some of his Senior Officers—with group of young officers-in-training—taking, in the Forest Hill School Dome, one evening of their course of training, recently—members of School Board also standing.

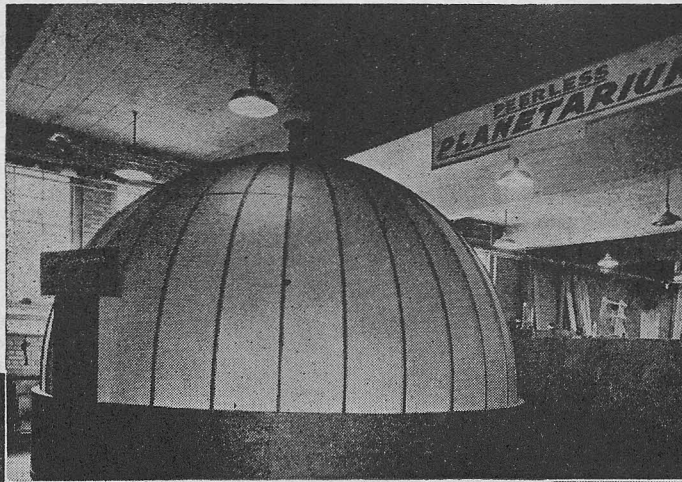


PEERLESS PLANETARIUM INSTRUMENT ITSELF—with unique gears, which enable the Sun, Moon, and Relief Earth Globe and their accessories, to duplicate nature and to produce all the changing phenomena referred to.



Reflected Image of SUN ACTUALLY SEEN MOVING NORTH AND SOUTH—from Cancer to Equator and Capricorn and back again—in course of year.

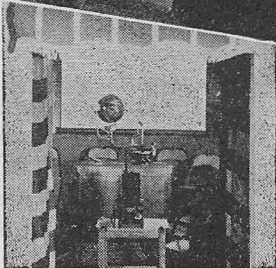
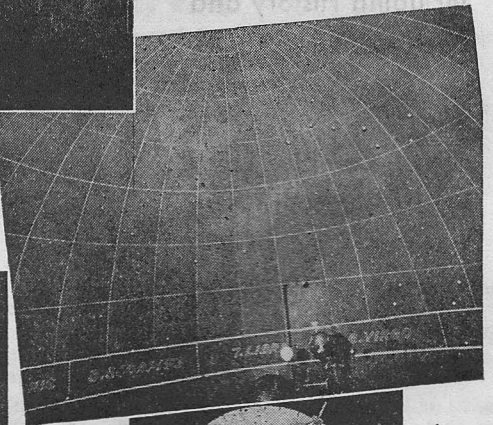
Reflected Image of MOON ACTUALLY SEEN MOVING AROUND EARTH and changing from waxing to waning Crescents—Gibbous and Full Moons in course of month.



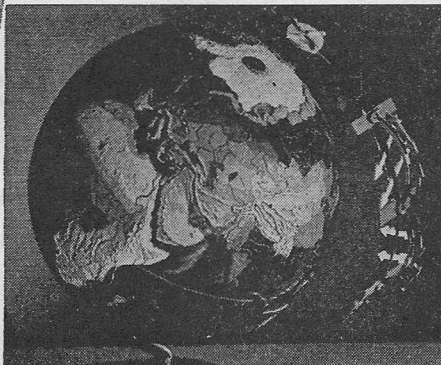
INSIDE VIEW OF STAR DOME—one section of Northern Sky with well known constellations in proper places—also Ecliptic-Zodiac Band, North Pole Star—Little Dipper—Big Dipper—Draco—Hercules, etc., clearly seen—also Sky Grid.



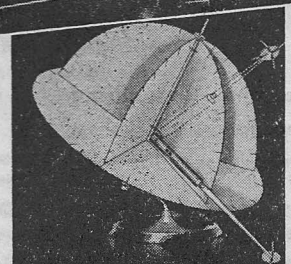
OUTSIDE VIEW OF STAR DOME (21 feet base diameter by 15 feet high) now standing in one section of Large Manual Training Room at Central School, Forest Hill, suburb of Toronto—inside seating capacity of dome—50 to 60—ample for full sized class.



Film machine and screen ready for use in Dome.



Close-up of VEGETATION-COLORED, CHROME-AND-PLASTICS, RELIEF EARTH-GLOBE—also—"CLIMATIC INDICATOR." Both Relief and Vegetation of Earth Globe worked out under supervision of Prof. Tatham of Department of Geography, University of Toronto. "Climatic Indicator" has unique values—shows moving basis of changing seasonal climate, as the sun (and also whole tropical and temperate air circulation zone—Trade Winds, Doldrums, etc.) moves north and south in course of year.



Automatic 4-angle spot-light P Z X "Fix"-Ander—demonstrating all sky latitude and longitude angles—including Aries Zero, Greenwich, Observer, and Star. All 4 leaves have spotlights.



## YOUNG NAVIGATION STUDENT'S DREAM OF PERFECT BLISS ACTUALLY COMES TRUE

A big, burly, broad shouldered, curly haired, blue eyed, sun tanned, football star type of youth arrives home one evening, with a young library of Navigation books under his arm. He barges in at the front door and blurts out, "Well, I've done it — I'm going to prepare for the Air Force (or Navy, or Merchant Marine). In the next two holiday months I'm to get the hang of this Navigation business, and join a regular Study and Training Group when School opens."

So, with boundless enthusiasm, and with a flaming fire of patriotism, he tosses his usual vacation aside, and settles down to study in earnest. Morning, noon and night, he is everlastingly at it, "getting the hang of this Navigation business." But at the end of his two months we find him, around midnight, just one stage removed from cold towels around his head and hot coffee at his elbow, biting his well chewed pencil, hair tousled, youthful whiskers neglected, brows knitted — helplessly turning round and round a complicated earth-and-sky diagram, peering into it first from one angle and then from another.

At first he is frankly puzzled and baffled, then irritated and frustrated, and at last, quite obviously, just plain mad, as he growls angrily to himself — "Azimuths — Zodiacs — Assumed positions — Zeniths — Aries zeros — Right ascensions — Greenwich hour angles — Declinations — Variations — Plus this — Deviations — Minus that — Equal to the other thing — Grrr! Grrr! Grrr! — Who in the world could ever make anything out of such a mass and maze of dry-as-dust book-stuff as that — charts, tables of figures, hieroglyphics?"

But this won't do — the clock strikes midnight — morning will soon be here — and tomorrow morning our young friend has to start in to his Study and Training Course at School. So he throws himself down on the couch, falls into a deep sleep, and of course dreams the Young Navigation Student's Dream of Perfect Bliss. Soon, in the middle of the night, from the next room, his somewhat worried, somewhat amused parents hear him talking in his sleep, outlining in authoritative tones, the Young Navigator's Improved Study and Training Course, with 1943 Streamlined Apparatus, somewhat as follows:—

"Now if I was one of these gold-braided higher-ups, if I was the Director of Education, — I'd make this thing **Live**, and **Move**, and **Work**. — just like it does in Nature! Can't be done? Of course it can! Here's how I would do it.

"I'd take 40 or 50 students into a class room, and I'd quickly run up a miniature Dome of our Northern Sky right over their heads. I'd paint it on the inside an attractive evening blue — place beautiful silver stars in groups or constellations, in exactly their proper places, just as we see them in the sky. I'd set the North Pole Star  $23\frac{1}{2}$  degrees off the Zenith, and on the base circle-line of the Dome, the Ecliptic, I'd name all the signs and constellations of the Zodiac, in 12 sections of 30 degrees each, all around the horizon of the Dome, and I'd have all the biggest stars shining out in their proper colours, blue, orange, yellow, etc.

"Then I'd have the Teacher, in a subdued light, using a flashlight as a pointer, get every student to 'read the sky' so they could run over all the constellations and main stars, using one group to find another, until they'd just flow out of the students as easily and joyfully as a popular song. Then I'd switch off all the lights, and in a minute, in the darkness, I'd light up nothing but the stars, so, like at midnight, there would be a perfect illusion of space — nothing but dazzling stars in a pitch black sky. The physical Dome would apparently have disappeared, and the whole heavens would be full of brilliant constellations shining, almost within arms reach, like diamonds in the blue-black velvet of the night sky. Boy, would that ever be **something!**

"Then I'd have all the constellations move around the sky, as they appear to do in Nature, some rising and setting at their proper times, places, and seasons, others going through their circumpolar motions, exactly as in Nature. Then, in the dim light of the Dome, I'd throw on the sky, in brilliant lines of light, an instantaneous Graticule or Grid of the whole sky, showing all lines of sky longitude and latitude fifteen or twenty degrees apart. And then I'd show this whole Grid moving slowly around the Dome, as it appears to do, by the revolving of the earth, hour after hour, all round the clock.

"Any 'fix' I wanted, around the whole heavens, I'd **show** it, at once, right there, and be done with it. I'd have a neat little four-angle gadget, attached right to the axis of the earth, that would project a small spot of light around the base line of the Dome, from Aries Zero to any angle I wanted, longitude, around the

Ecliptic, — and from that point up toward the Zenith to any degree of latitude. For instance, the point of light starts at Aries Zero and moves around, so far Right Ascension, say 15 hours, 25 minutes, 13 seconds (or an equivalent number of degrees) and from that particular spot or angle the point of light would rise up toward the Zenith say 25 degrees, 19 minutes, and 10 seconds — and there, at once, would be my 'fix.' This little gadget would automatically record, on its own dials, all the different combinations of PZX angles — Aries, Greenwich, Observer, and Star, — not only **seen**, but the **answer right there**, and the whole simple **principle** of the thing **understood**, first crack out of the box!

"Then I'd throw a short Motion Picture on a small screen, right there in the Dome, and in 15 minutes every student would actually see and understand, not only the whole Solar System in motion round the Sun, but also, in close-ups in motion, each individual heavenly body — the Sun, each individual Planet, their Moons, etc., and the peculiar manifestations of each body. The fundamental principle, the causes and the effects, of individual or combined phenomena would at once be seen, understood, and never forgotten. This would be a fascinating **accomplishment** of 15 minutes, instead of a doubtful and continuous **confusion** spread over 15 weeks.

"Having found where our Sun, Earth, and Moon all came from — we could now study them not only intensively, but intelligently, from the Navigation point of view, using the most brilliant and up-to-the-minute planetarium **instrument** with light effects showing in actual movement and operation all the essential phenomena as we actually see them taking place in Nature. These would include the Earth, tilted, and with Relief Surface — Daily and yearly movements of Sun and Moon actually seen taking place — All the various positions of the Sun and Moon at any day or hour throughout the year — Time — Tides — Eclipses actually seen taking place — Equality and Inequality of Day and Night — Seasons — Circulation of air and distribution of Rainfall and Vegetation — Climatic Indicator showing causes and effects of Climate in actual operation over whole Earth, and at all different places and seasons — Equator — Ecliptic — etc., etc.

"But this," said our young friend, muttering to himself as he began to wake up "I don't have to go into any further — there is an instrument that does all this very completely and very brilliantly."

Suddenly he woke up with a start — looked at his watch — was shocked to find how late he was — could hardly make it to school in time. With the rush and roar of a young bull in a china shop, he dressed, gulped down a cup of coffee, grabbed his armful of books, and the rest was high knee-action down the street.

Arrived breathless at school — Central School, Forest Hill Village, well known residential suburb of Toronto — you could have knocked him down with a feather when he rushed right into his dream of the night before — a complete Planetarium Equipment, Dome, Film, Navigation Gadgets, and Instrument — already installed and in operation as an actual reality. "What is this, anyway? — or is this **this** — and am I **me**?" he exclaimed. "Just imagine, the whole sky brought **inside** — possible to study any time, and all the time — no more rain, or clouds, or fog — no more long and cold nights, and useless days — no more waste of gas or tires — no more loss of sleep and waste of time — no more cold towels, hot coffee, and headaches — no more frustration and exasperation. Is it **real** — can it be **true** — or am I still asleep, and is somebody spoofing me?"

When last seen our enthusiastic and patriotic young football star was still pinching himself — still rubbing his eyes — still staring all around — in stunned and surprised amazement. For the Young Navigation Student's Dream of Perfect Bliss had come true. The awful **burden** of Navigation — the Greek and Chinese of its maze of technicalities — has disappeared like magic, overnight. The simple component parts — Geography, Physiography, Climatology, Meteorology, and Astronomy — were at last to be opened up and served to beginners like him in a way they could at once **assimilate** and **digest**, with real gusto and relish — like tempting oysters on a silver plate!

## SCOPE OF THE PEERLESS PLANETARIUM

The following gives an approximate idea of the unlimited field which the Peerless Planetarium covers. It demonstrates fully:

1. **The Earth, Moon and Sun** in space.
2. **Comparative sizes** of Earth, Moon and Sun.
3. **Solar system**—relation to other planets.
4. **Shape** of the Heavenly Bodies.
5. **Motions of the Earth**—axial and orbital—actually seen.
6. **Permanent Inclination** of the Axis of the Earth.
7. **Motions of the Moon**—axial and orbital—actually seen in their true relations—a result never before obtained.
8. **Relief Surface of the Earth**—the great land and water divisions, great river systems, and mountain chains, are seen in relief.
9. **Proper conception of Direction** on the globe.
10. **Position of the Earth** at any month, day of the month, hour of any day.
11. **Time**—how obtained, relation of time to longitude, difference in time between any two places on the earth, Solar, Mean and Astronomical time.
12. **Eclipse Seasons**—actually observed.
13. **Eclipses of the Sun and Moon**—total and partial. These beautiful phenomena are actually seen taking place, thereby showing both effect and cause.
14. **Phases of the Moon.** These are actually observed as are the eclipses, thus illustrating the relation of cause and effect. This phenomenon is seen from the standpoint of the earth itself.
15. **Tides**—High and Low. The direction of the tide round the earth may be actually traced and the tide may be traced arriving at any place about fifty minutes later each succeeding day.
16. **Equality and Inequality of Day and Night**—length of day and night at any or all places on the surface of the earth may be seen at a glance at any time of year. All the accompanying conditions which constitute the causes are seen at the same time.
17. **Apparent Yearly Movement of the Sun.** This phenomenon with the accompanying causes actually witnessed. On December 21st the sun is seen actually tracing out the tropic of Capricorn, on March and September 21st it is seen crossing the line (the terrestrial equator), while on June 21st it is observed tracing the tropic of Cancer.
18. **Apparent Daily Movement of the Sun and Moon.** Impossible as this may appear, the observer can actually see the sun and moon rising and setting exactly as they do at any point on the earth's surface while all the accompanying conditions are simultaneously witnessed. For example the Midnight Sun can be actually seen at the Arctic Circle—the sun may be seen in the heavens for six months at either pole—the moon can be seen rising and setting and the difference in time of moonrise and moonset is at the same time observed. The altitude of the bodies is also seen at any time of the year.
19. **Circle of Illumination.** This is actually seen—at the equinoxes it may be observed cutting both poles; at the summer or winter solstice it is seen with the revolution of the earth tracing the Arctic and Antarctic Circles. Thus the basic lines of latitude are all determined as they are in nature.
20. **Morning and Evening Star.** This phenomenon is actually witnessed with the accompanying causes, the observer not only tracing out, in space, the course of the planet with his eye but at the same time seeing it as he really does from the earth itself.
21. **Seasons.** The change of the seasons may be actually witnessed. For example the snow-line is seen alternately advancing and receding—portions of the earth's surface are observed passing from winter to summer conditions and from summer to winter—days may be seen alternately lengthening and shortening showing directly the effect of insolation while at the same time all the accompanying causes of the seasonal changes are observed. In this topic alone work may be covered in a short half-hour which would otherwise take a week to accomplish—or what is more likely, might not be successfully covered at all.
22. **Circulation of the Air.** This demonstration is one of the invaluable features. This important and basic geographical topic is thoroughly and completely demonstrated—the heat equator and its position at any time of year—the perpendicular rays and their location at any time—the ascending movement of warm air at the heat equator—the high pressure belts, north and south—the trade winds and their migrations along with the migrations of the heat equator and the high pressure belts—the anti-trades or the prevailing westerlies—the polar winds—the basic elements comprising the planetary circulation of the air—all may be seen at a glance.
23. **Distribution of Rainfall.** As the circulation of the air determines rainfall this important division of geography is demonstrated simultaneously with the preceding topic, thus illustrating in a remarkable manner the great principle of "inter-relations" in the modern teaching of geography.
24. **Climate and its Distribution.** The student or observer may stand by and watch all the accompanying causes and conditions of the distribution of climate over the face of the earth. In addition to the above, circumpolar caps, mediterranean climate, oceanic climate, continental climate, monsoon climate, monsoon winds and the change of the monsoon—these basic phenomena must be seen to be appreciated.
25. **Vegetation and its Distribution.** As vegetation depends upon rainfall and climate it may be readily seen how necessary the full demonstration of the preceding topics is to a complete comprehension of this basic division—another example of the principle of "inter-relations." Tropical, temperate and polar vegetation, location and causes of the desert regions of the world, the semi-arid regions, the distribution and causes of forests and grass lands, the products of the different climatic and vegetative regions of the world.
26. **Distribution of Animal Life** and its Relation to Climate and Vegetation.
27. **Life of Sea and Land.**
28. **Activities of Man** and Their Relation to Climate and Vegetation.

## UNQUALIFIED COMMENDATION BY HIGHEST AUTHORITIES

**DR. CLYDE FISHER**—Curator in Chief, Department of Astronomy and the Hayden Planetarium, American Museum of Natural History, New York City:

"I am intimately familiar with the Peerless Planetarium, having used it myself in my classes in Elementary Astronomy and Geography. . . . It lays the foundation of the essential basic causes of natural and human phenomena which every student should comprehend. . . . An excellent teaching instrument. Really I cannot speak too highly of it. . . . A wonderful teaching device . . . has a wide range of usefulness in teaching Astronomy, Meteorology, and Geography."

**DR. C. A. CHANT**—David Dunlap Observatory, University of Toronto, Ontario, Canada:

"I examined it with some care. It illustrated quite satisfactorily various phenomena of the solar system. . . . To teach the motions of the celestial bodies, good models are almost indispensable."

**MR. JAMES E. KAVANAGH**—Prominent New York City Business Executive:

"I want to congratulate you on what you have done. I was very favorably impressed with the graphic manner in which you present to students the movements of the Sun, Moon, and Earth, together with the results that follow the various solar movements. You have something that is too good to keep under a bushel. It ought to be possible for every boy and

girl, and millions of men and women, to have a proper appreciation of the way in which at least a portion of our wonderful universe functions."

**DR. GRIFFITH TAYLOR**—Professor of Geography, University of Toronto, Ontario, Canada:

". . . an apparatus, the Peerless Planetarium, for demonstrating a number of fundamental problems in Astronomy, Geography, and Allied Sciences, which seems to me of great merit."

**DR. RALPH E. HORTON**—Chairman, Standing Committee on Science, Board of Education, New York City:

"Thank you again for demonstrating the device to us. I must admit that I was agreeably surprised by the way the performance of the Peerless Planetarium confirmed what you told me about it in advance. It is the most authentic, objective, exposition of the relations of the Sun, Earth, and Moon, and the consequences of their mutual motions, that I have ever seen."

**ROYAL ASTRONOMICAL SOCIETY OF CANADA**—Resolution passed after full demonstration of the Peerless Planetarium:

"Believing that the teaching of Geography would be greatly assisted by the use of the Peerless Planetarium, we commend it to the consideration of educational authorities."

**MR. V. K. GREER**—Chief Inspector of Public and Separate Schools, Province of Ontario, Canada:

"The finest piece of educational apparatus I have seen."