PHYSICS-BIOLOGY

Cut Tissue Ultra-Thin

See Front Cover

➤ HOW thin is a slice? With a new method developed by the National Bureau of Standards it is so thin that a stack of 750 slices would be as thick as an average human hair.

The Bureau's slicing technique was developed for study of thin sections of tissue under the powerful electron microscope. Terming the new advance "truly exciting," Bureau Director Edward U. Condon said that it "promises to be an important aid in such fields as cancer research." Researchers in biology, medicine, agriculture and even the physical sciences are expected to use the new super-thin slicing.

Here's how Bureau scientists cut world's thinnest slices:

The specimen to be sliced is embedded in a clear plastic (n-butyl methacrylate, similar to plexiglas or lucite but softer). This embedded specimen is mounted in a brass block and cooled by carbon dioxide gas. As the atmosphere warms the brass block, it expands for such a tiny distance that you cannot see the movement. After this expansion, the tiny bit of the specimen which protrudes is cut with a laboratory slicing device, called a microtome.

The slice is so thin that you can't see it edgewise under the most powerful light microscope.

On this week's cover of the SCIENCE NEWS LETTER a section of a frog's eye is shown magnified 25,000 times its actual size.

This new method was developed by three Bureau scientists, S. B. Newman, E. Borysko and Max Swerdlow.

Chief advantage of these thin slices is for studies under the powerful electron microscope. Because the electron beam of this instrument has only slight penetrating power, specimens for study must be made extremely thin.

Science News Letter, June 25, 1949

REHEARSAL FOR SKY SURVEY —Dr. Edwin P. Hubble is shown with the 48-inch Schmidt photographic telescope which will be used to provide the world with the first definite photo atlas of the heavens. The four-year project will be launched July 1 by the National Geographic Society and Palomar Observatory.

ASTRONOMY

Sky To Be Photographed

➤ A PHOTOGRAPHIC survey of the sky using the 48-inch wide-angled Schmidt telescope which is located on Mt. Palomar, Calif., was announced jointly by the California Institute of Technology, operating the observatory, and the National Geographic Society, co-sponsoring the project.

For about four years this Schmidt survey will be recorded on 14 x 14 inch plates. It is planned at the end of that time to produce a sky atlas of some 2,000 reproductions of photographic plates, covering about three-quarters of the heavens, and selling for about $2,000.

The survey photographs taken with the wide-eyed telescope will guide Palomar's 200-inch telescope, world's largest, to intensive, small-area study.

Virtually identical exposures of each area of the sky reached will be made using both blue and red filters for comparison. A blue exposure will take a half hour and a red exposure twice as long. The best night's work will make only four pairs of photographs.

Photographs will be taken with light that has traveled for 300,000,000 years (at 186,000 miles per second) from the most distant objects to be photographed.

The Schmidt survey photographic work will be in charge of Dr. Albert G. Wilson, assisted by Dr. Josef J. Johnson and Robert G. Harrington, with Dr. Edwin P. Hubble director of the project.

The most famous astronomical atlases of the past are the Ross atlas made at Yerkes Observatory, largely devoted to the Milky Way, the Wolf-Palifa charts issued earlier from Heidelberg, and the British Franklin-Adams charts of about three decades ago. These atlases were issued in book form.

Harvard Observatory has the largest collection of photographs of the sky in the world, consisting of about a half million photographic plates made with about 40 different telescopes from both the northern and southern hemispheres. The whole heavens have been covered perhaps a thousand times by half a dozen different Harvard telescopes surveying the metagalaxy and recording more than half a million galaxies, great stellar aggregations like our Milky Way.

The 48-inch Schmidt telescope on Palomar is at present the largest telescope of its type in service. A larger instrument, a 60-inch Baker-Schmidt telescope of Harvard College Observatory, will be located at its Bloemfontein, South Africa, station in the future. Upsala Observatory in Sweden is building a 48-inch Schmidt instrument which will equal the Palomar instrument. Scheduled for completion next year is a 32-inch Baker-Schmidt telescope to be located at Bloemfontein as the joint enterprise of Northern Ireland's Armagh Observatory, Eire's Dunsink Observatory and Harvard Observatory. The Mexican National Observatory Tonanzintla has had a 26-inch Schmidt since 1942 with the world's largest astronomical prism, built with the cooperation of Harvard. About 40 lesser Schmidt instruments are in use.

The Schmidt camera is neither a reflector nor a refractor, but rather combines the two since it employs both a mirror and a lens.

The ordinary reflecting telescope focuses the rays of light from a star by means of a mirror of special design. Rather than being sphere-shaped, it is a paraboloid.

Bernhard Schmidt of the Hamburg Observatory at Bergedorf, Germany, hit upon the idea of placing a specially figured lens far in front of a spherical mirror. Light rays entering the telescope are bent by this lens, before they strike the mirror, in such a way that all are brought to a focus at about the same point.

Science News Letter, June 25, 1949

GEOLOGY

New Geological Institute To Have 10,000 Members

➤ TEN thousand scientists who find our minerals, study our oil fields, and discover the record of the rocks for past ages have joined to form the American Geological Institute with Dr. David M. Delo as executive director.

With headquarters at the National Research Council in Washington, the institute will act for 11 geological, mining, geophysical and other professional societies.

Science News Letter, June 25, 1949