

or possibly a quiescent comet.

It is possible, in fact, that if the object is a comet, earthbound observers may never know it. A defunct comet—a “dead” comet nucleus — would already have given off most or all of the volatile material that would otherwise produce the familiar hazy appearance of the coma, to say nothing of a tail. In addition, however, Object Kowal always stays far from the sun by known cometary standards, so that it may never get warm enough to give off even an existing supply of volatiles. “We’ve never seen a comet beyond 11 AU before,” says Marsden, adding that most have been observed at less than 6 or 7. Object Kowal’s perihelion of 8.51 AU could mean that it will get warm enough to reveal a cometary nature when it comes around in the mid-1990s, but it may not. Frustratingly, the lack of visual and spectroscopic evidence will not prove that the object is *not* a comet.

Ironically, the object was actually singled out on the 1941 plate — and even marked with an arrow—in a study done in the early 1950s, about a quarter-century before Kowal’s “discovery.” It had been spotted by Ann B. Hearn (now married to University of Maryland astronomer Thomas Matthews), working with the late Harlow Shapley on a search for distant galaxies. It was Kowal, however, who found that the object was circling the sun, thus earning recognition as its discoverer and the honor of giving it a name. Although the object’s nature is still in question, Kowal has in fact suggested a name: Chiron, one of the centaurs of Greek mythology. If other, atypically distant minor planets are found, he says, perhaps they might be thus categorized as “Centaurian planets.” □

IWC supports larger Pacific whale takes

Meeting in Tokyo this week in a special session called by the Japanese and Russian delegations, the International Whaling Commission (IWC) approved an increased quota on commercial hunting of North Pacific sperm whales. In June the IWC approved a take of fewer than 800 and a total ban on the take of any bowhead whales. The latter caused severe repercussions amidst coastal Eskimos whose subsistence culture depends on eating bowheads (SN: 9/17/77 p. 185). At an IWC scientific committee meeting in Canberra, Australia, a week prior to this Tokyo meeting, new data used in mathematical models of sperm whale population dynamics supported an increased North Pacific take of 6,000; at the same time, the committee again endorsed a total bowhead ban. But in full committee the IWC decided to rescind the total bowhead ban for political (and cultural) reasons and to support an increased sperm whale take of 6,000. □

DECEMBER 10, 1977

King Philip’s tomb — A golden find



Wide World Photos

About 17 feet below the Greek farming village of Vergina lies what a University of Salonika archaeologist believes, “without reservation,” is the 2,300-year-old tomb of King Philip II of Macedon, father of Alexander the Great. Chemical analyses have dated the tomb at 350 to 320 B.C. But Manolis Andronikos, who found the tomb, says the deciding factor in identification of the tomb was his discovery of five small ivory heads on the tomb’s floor. The heads, he believes, portray Philip, his parents, his first wife, Olympias, and their son Alexander. A solid gold casket contained Philip’s bones, he says.

Hyperactives as teens: Problems linger

For years, the “they’ll grow out of it” philosophy has been applied to both hyperactive and learning disabled children. But research results now indicate that while many such youngsters do improve in later life, their academic and social progress often appears to be slower than hoped for.

That was among the conclusions of a followup study of sixty-two 14-year-old boys who had been diagnosed as learning disabled (LD) in grade school. The youngsters — classified as either hyperactive, hypoactive or normoactive (normally active) — were compared with a control group of 31 non-learning disabled children who had normal levels of activity. The LD youngsters, although of average or better than average intellectual level, had either failed a grade or were near failure and were about two years behind controls in oral reading achievement.

In the extensive followup, researchers from the University of Arkansas’s Behavioral Laboratory and Child Study Center tested the children on a variety of academic and social adjustment measures. In addition, the youngsters were rated by their teachers, parents and a team psychiatrist.

The results at age 14, reported in the *OCTOBER AMERICAN JOURNAL OF ORTHOPSYCHIATRY*, include:

- Only two of the 23 hyperactive boys presented no problems for either the home, school or community. Ten remained academically below normal and exhibited

social deviancy as well. Three who were academically adequate continued to have behavioral problems. And eight, although still academically handicapped, had become generally cooperative at home and at school.

- Normoactive LD youngsters presented principally academic problems — 72 percent continued to have basic problems in two or three basic skills.

- Among hypoactives, 71 percent had marked deficiencies in two or more academic areas, and only one in 14 was achieving normally in all areas.

- Sixty-one percent of the control group students remained adequate to superior in all three areas tested by the Wide Range Achievement Test.

The researchers were particularly discouraged by the outcomes of the hyperactive boys, especially since earlier studies in the field (in the late 1960s) indicated that children might outgrow hyperactivity between the ages of 10 and 14. But this proved untrue in the Arkansas study, even though most of the LD youngsters had received the benefit of special learning programs and medication between their original diagnosis and the followup study.

“We hoped these various programs would have made an impact, but that didn’t happen,” team researcher Peggy T. Ackerman told *SCIENCE NEWS*. “If anything, the children treated more intensively [with tutoring, resource rooms, medication, etc.] turned out worse off than all the rest. ... But of course they were the ones

389

who were worse off to begin with," she said.

Ackerman and colleagues Roscoe A. Dykman and John E. Peters were also disturbed to find that many of the hypoactive youngsters remained "overly passive" at followup. "Five of the hypoactives were extremely withdrawn, cold or lacking in affect — and one was so silly as to be bizarre," they report.

But the team's main concern was directed toward the hyperactive youngsters, most of whom at age 14 still exhibited the fidgetiness that plagued them in grade school, and a number of whom had gone on to have trouble with school and law enforcement authorities.

There is hope, however, for the post school years, according to Ackerman. A recent followup of hyperactive youngsters as young adults by Canadian researcher Gabrielle Weiss indicates that once such persons get out of school and into the job market, they "seem to do all right," Ackerman says. "Once they get away from the rigid demands of school, things seem to improve," she says. "As they get into their mid and late 20s, they adjust better. What I'm guessing is that age is the best thing that can happen to these kids." □

Pioneer 11 will go outside Saturn rings

Despite the near-unanimous vote of the Pioneer 11 spacecraft's principal scientists (SN: 11/12/77, p. 315), NASA officials have decided to send the probe outside the rings of Saturn, rather than between the rings and Saturn itself, when the craft flies close to the planet in early September of 1979.

The primary reason is to let Pioneer 11 serve as a pathfinder for the Voyager 2 spacecraft, which will pass close to Saturn in August 1981 with the option of then going on to a 1986 encounter with Uranus. There has been some concern that potentially spacecraft-killing particles may exist outside (as well as inside) the readily visible ring structure (SN: 10/15/77, p. 249), so Pioneer 11 will be aimed to cross through the plane of the rings at the same distance from Saturn as the ring-crossing of Voyager 2's Uranus-bound trajectory option. This will allow time to move Voyager 2's crossing outward (sacrificing the Uranus option) in the event that Pioneer 11 is destroyed.

Many of the Pioneer scientists had argued that an inside-the-ring passage would be more scientifically valuable, even if it ended abruptly at the ring plane. Voyager, however, would stand to lose much of its *pre*-crossing data as well, since the sophisticated probe will be gathering data so rapidly that many of the measurements must be stored on an on-board tape recorder for playback after the encounter. □

Reflecting on superluminal speed

An object that goes faster than light is about as welcome to physical scientists as a real live ghost would be to the American Humanist Association. Yet there are at least three quasars that appear to be composed of two or more pieces that are flying away from each other at speeds greater than that of light. The response of most astronomers is that it is just an appearance and must somehow be explained away. The most popular explanations to date seem a bit contrived, however, and a recent review of the subject by M. H. Cohen and colleagues left readers to conclude that maybe ghosts do exist.

Many purported ghost effects are done with mirrors, and that essentially is what's causing the appearance of objects going faster than light, argues D. Lynden-Bell of the Institute of Astronomy in Cambridge, England, in the Dec. 1 NATURE. He calls it a light echo.

Lynden-Bell has a theory of a quasar that sees it as a black hole surrounded by a disk of infalling matter. Near the hole, this disk is inflated almost to a spherical shape by radiation pressure. "Just as water flowing into the black hole in a bath does so around a narrow vortex," Lynden-Bell writes, "so the sphere is pierced by a narrow vortex hole on the sides of which ve-

locities close to c are reached as the central black hole is approached."

This kind of action could produce flashes of light moving in opposite directions along the axis of the vortex. As these flashes struck patches of ionized gas in space, they would set it moving at speeds near that of light. The patches hit by the light burst would be visible from earth by reflection of the light from the central source or by light of their own generated as a result of the disturbance. Assuming that the central black-hole object was not visible from earth, the two plasma patches would appear to be moving apart at a relative velocity of nearly $2c$ if the arrangement were seen broadside. There is an historical precedent for this kind of model in the explosion of Nova Persei of 1901. Light from this explosion was reflected from a nearby nebula, and the part of the nebula that reflected the "echo" appeared to be moving across the sky at a speed of $2c$.

But the faster-than-light phenomena include apparent velocities up to $8c$ and also the galaxy 3C120, which at times has looked like a double source and at times like a triple source. The galaxy can be explained by a model in which the central black-hole object varies between visibility and invisibility from time to time. The apparent large multiples of c are gotten rid of by changing the value of the Hubble constant from the commonly used 55 kilometers per second per megaparsec to 110 kilometers per second per megaparsec. □

Luna 24: Shaking up the moon-watchers

None of the scientists who have been studying the 383 kilos of Apollo lunar rock samples would be rash enough to say that all or even most of the moon's mysteries have been solved as a result. Even so, a few *grams* of material provided last year by the Soviet Luna 24 robot spacecraft have now clearly informed the selenologists that a great deal more remains to be learned. For the Luna 24 sample is like no other sample ever brought back from the moon.

Only about 650 grams of moonstuff were returned by the probe, and the 3-gram U.S. share (presented as a gift by Soviet officials earlier this year) is barely half the weight of a nickel. Yet that tiny allotment, together with a few similar or smaller portions allocated to other countries such as France, brought nearly 100 scientists to the Lunar Science Institute in Houston last week for the first "single-sample" moon-rock gathering since the post-Apollo 11 meeting of 1969.

Luna 24 collected its prize from Mare Crisium, the major basin closest to the eastern limb of the moon's visible face, and there has been hope that the top of the sample core might include material blasted over the horizon from craters being formed on the otherwise unsampled

far side. Unfortunately, it is believed that the coring tube may have nudged the critical topmost layer of material aside as it dug in. Also, according to Ted Maxwell and Farouk El-Baz of the Smithsonian Institution, material ejected from the likeliest candidate crater — Giordano Bruno — probably just missed the landing site.

But the site had no need to import its surprises. One of its most distinctive characteristics is the dominant presence of very-low-titanium (VLT) basalts, a type otherwise known only in tiny traces from Apollo 17 and Luna 16. It is also lower in potassium (and apparently in the potassium-rare earth-phosphorus suite known as KREEP) than the Apollo-sampled central regions of the lunar near side. Olivine in the material has revealed some "unique" high-silica, low-alumina glass inclusions that are "at present inexplicable in several respects," and there is even a bit (though probably less than 2 percent) of highland material transported from outside the basin itself. The material is also providing valuable calibration for earth-based geochemical surveys of the moon, which have become abruptly more important with Luna 24's revelations of what Apollo didn't find. □