New York City, is already convinced by the early chemical reports that the moon could not have come from the earth. He argues that their origins were separate.

But the chemical differences (SN: 6/28, p. 616) must still be accounted for. Most theories hold that the planets condensed out of a cloud of material ejected from the sun. If two bodies like the earth and the moon were condensed from the same part of such a cloud at the same time, they ought to have pretty nearly the same chemical composition.

A few people have tried to explain the fact that they apparently do not by saying that the moon condensed later than the earth out of material left over from the earth. One such speculation puts the moon's age at about 3 billion years. On the basis of the new figures, however, this would be definitely out of court.

Still others resolve the chemical problem by saying that the moon's chemistry has nothing to do with the earth's neighborhood. The moon was formed, they contend, in a different part of the solar system and happened to drift close to the earth where it was captured by the earth's gravity.

Dr. Jastrow regards such a capture as statistically unlikely but he can offer little more than a shoulder shrug as an alternative explanation. □

DEFENSE RESEARCH

MIT under the gun

UPI

Demonstrations at MIT: University-military ties still under attack.

The student and radical demonstrations which took place at the Massachusetts Institute of Technology last week were not particularly large or violent, by current standards for such events. Early in the morning of Nov. 5, a crowd of between 300 and 700 pickets began to block the entrance to the off-campus Instrumentation Laboratory, preventing employes of the laboratory from reporting to work.

The university had already obtained a court injunction which barred demonstrators from obstructing school operations; around 9 a.m., several hundred police in riot-control costumes rapidly dispersed the crowd. There was little scuffling, and only one student was arrested.

But if the disturbance itself was ritualistic, the underlying controversy was of fundamental importance to colleges and universities throughout the country. The support of academic research geared to military objectives was at issue. MIT receives more research funds from the Department of Defense than any other university. Nearly half of its $17 million annual budget is supplied by the military. The affiliated Instrumentation Laboratory drew approximately half of its $54 million budget from Defense last year, and the rest from the National Aeronautics and Space Administration. The other principal MIT-affiliated institution, the Lincoln Laboratory, is financed almost exclusively by the Pentagon, and had a budget of some $66 million in 1968.

Student and faculty criticism of MIT's ties to the defense industry has mounted during the last few years. Other universities with similar though less extensive ties, such as Stanford and Cornell, have also been faced with student demonstrations, and both have moved to divest themselves of the controversial affiliated laboratories. MIT moved less quickly.

MIT protesters in the past have demanded that research be halted immediately on such projects as multiwarhead nuclear missiles for Poseidon submarines, helicopters used by the Army in Vietnam, and a computer program to collect social data of interest to the CIA and the Defense Department.

Officially, MIT maintains that its military research is necessary for the national defense and does not undermine its academic integrity. At the same time, the university has been searching for a way to reduce its defense commitments.

MIT president Howard Johnson has authorized a moratorium on accepting new classified research projects from the Government and has asked the faculty to give him a year to determine whether Federal and private money can possibly be found to replace Pentagon funds.

More spectacularly, he announced last month the impending retirement of the head of the Instrumentation Laboratory, Dr. Charles Draper, who developed the inertial guidance systems which form the basis of the laboratory's research.

The military has been Dr. Draper's main client since World War II. He produced the gyroscope gunfight for the Navy, and the guidance system for the Polaris missile.

Dr. Draper, for his part, maintained that he had been fired, and defended the Instrumentation Laboratory's work for the Defense Department and doubted the chances of turning it in more civilian-oriented directions.

"There's no money for these civilian projects," he said, "and the people in the laboratory are not going to work for nothing."

The student demonstrators also doubt the feasibility—if not the sincerity—of the proposed changeover. Barring a sudden revision in the nation's spending priorities, it is unlikely that MIT will find enough non-defense money to maintain the Instrumentation and Lincoln Laboratories.

A smaller operation, the Fluid Mechanics Laboratory (SN: 8/16, p. 132), is barely making the grade on social-relevance money.

It is more probable that the university will attempt, as have Stanford and Cornell, to sell its military-research laboratories to the Goverment or to private business. Whether such a move would satisfy MIT's critics remains to be seen. The protesters say that the restoration of academic purity is not enough, and that they will continue to demonstrate against laboratories that produce military technology regardless of who owns them.

As of yet, Congress has hesitated to tamper with Defense Department spending (SN: 10/11, p. 326), although the Defense authorization bill sent to President Nixon this month forbids the Pentagon to engage in non-military research, an activity on which the Pentagon spent $400 million last year, mostly in the social sciences. □