Table 1. FIRST EMPLOYMENT OF HIGHER DEGREE GRADUATES IN THE USA

Field of doctorate	Year of doctorate	College and university	Elementary and secondary school	Government	Non-profit	Industry	Other	Foreign employer	Total with known employer
Total all fields	1961-63	18,877	1,722	2,410	1,305	4,319	763	2,828	32,224
	1964-66	27,362	2,082	2,921	1,760	5,499	1,127	3,961	44,712
Physical sciences and engineering	1961-63	4,643	27	598	374	3,521	345	912	10,420
	1964-66	7,259	5	845	498	4,540	597	1,338	15,082
Biological sciences	1961-63	3,096	33	640	193	442	126	808	5,338
	1964-66	4,255	4	776	289	516	184	1,135	7,159
Social sciences	1961-63	3,133	143	827	372	227	191	487	5,380
	1964-66	4,328	82	833	497	255	203	610	6,808

are attracted each year. This trend is especially marked in the physical sciences and engineering. Industry is the major employer of physical scientists and engineers, but it employs fewer than 10 per cent in other fields. The percentage of scientists and engineers with doctorates going into industry, however, has fallen rapidly from 44 per cent in 1958-60 to 30 per cent in 1964-66. Mathematics, physics and chemistry show especially sharp declines in industrial employment. Fewer than 10 per cent of the new higher degree graduates accepted employment overseas, but this figure should be balanced against the number of foreign graduate students (14 per cent) in the country. Brain drain enthusiasts should have fun working on all these figures.

No Merger for Engineers

THE projected merger between the Institution of Mechanical Engineers and the Institution of Heating and Ventilating Engineers is off. After discussions lasting the best part of a year, the heating and ventilating engineers finally decided that they no longer wished to press on with the merger. The decision has left the mechanical engineers slightly baffled. "We don't know why they decided against the merger" an official said this week. "It's very disappointing."

Merger talks began when the heating and ventilating engineers decided that they wanted to increase their influence. The easiest way of doing this, short of a royal charter which was very unlikely to be granted, was to amalgamate with an established body. The obvious choice was the Institution of Mechanical Engineers, and talks began. It was first agreed that the heating and ventilating engineers should enjoy a status within the combined institution much like that enjoyed by the automobile engineers. They would have been virtually an autonomous group, with their own council and their own chairman, and members in the different classes of membership in the IHVE would have been able to transfer to the equivalent classes in the combined body. The IHVE would have been able to publish its own journals and hold its own conferences and meetings. The mechanical engineers had agreed to set up joint working parties to study the problem of technician engineers, whose position the IHVE was anxious to protect. Despite all this, the heating and ventilating engineers told the mechanicals on December 20 that they did not wish to proceed.

One heating engineer suggested this week that the IHVE feared that it would be swamped when it joined the mechanicals. There does seem to have been some opposition within the profession, although the mechanical engineers say that they have received several letters from individual members of the IHVE regretting

the decision. The Institution of Mechanical Engineers denies that it ever wanted to make a takeover bid for the IHVE, and "sincerely hopes that this is not the end of the affair. The door is not closed to further talks". Meanwhile, joint meetings will continue as before. Clearly the hope is that the IHVE will eventually see the folly of its ways.

Safety in Space

by Angela Croome

SEVERE strictures on National Aeronautics and Space Administration (NASA) complacency, which it considers was responsible for the deaths of three astronauts in last year's Apollo fire, are contained in the Congressional report of its own inquiry into the circumstances of the accident. Some of the Senate space committee are doubtful if the shortcomings of the contractors' work would have come to light without the accident, and NASA is criticized for not passing on to Congress reservations on the performance of the Apollo main contractor, North American Aviation, which was the subject of a secret NASA report in 1965. In summary, "NASA's performance—the evasiveness, the lack of candour, the patronizing attitude exhibited towards Congress, the refusal to respond fully and forthrightly to legitimate congressional inquiries, and the solicitous concern for corporate sensitivities at a time of national tragedy—can only produce a loss of congressional and public confidence in NASA programmes".

In the meantime, extensive replacement of materials in the capsule and spacesuit to make these "almost fireproof" has been completed. A quick escape hatch has been substituted for the previous design. The total cost of these modifications is estimated at \$100 million. The changes have forced the forfeit of between 600-1,000 lb. in the overall weight of the spacecraft and this in turn has required the re-design of the return parachute system to support it. A fully fire-resistant material, Beta fabric, has replaced high-temperature nylon (Nomex) for the outer layer of the Apollo pressure-suit. The inflammable boot-soles and helmet (polyurethane) have been replaced by carboxy-nitroso rubber and a silicone material respectively. Nomex has been substituted for nylon as the material of the suit liner. The opportunity has been taken to make the suit more comfortable and durable. Metallized patches cover pressure points and the outside of the gloves are equipped with artificial nails or claws to assist sample collection. It is estimated that about 1,000 yards will be the walking limit of an astronaut kitted out for the first lunar excursion.

On its first flight on January 23 the Apollo lunar model acquitted itself well, and NASA authorities are

now considering whether the other scheduled unmanned flight could be dispensed with. Premature cut-off of propulsion firings has been attributed to over-conservative programming of the on-board guidance computer and not to malfunction.

Thorough check-out of the various components of the lunar landing mission is essential, since there is considered to be no possibility of survival or rescue from an accident on or near the Moon. Dr George Mueller, director of the manned spaceflight programme, recently made clear that on the Moon there will be a 36 h oxygen supply for the two astronauts, not a large margin on the projected 22 hour stay. No rescue provisions are being made. It would take a month at least to get a relief party out there, Dr Mueller pointed out.

Nevertheless NASA has recently appointed a Safety Director whose job it will be to look into the problems of orbital rescue as well as the more conventional aspects of spacecraft and range safety. In his mid-40s, Bob P. Helgeson has had experience in atomic energy as well as with the X-15 hypersonic research aircraft programme.

Hovercraft Launched

THE largest hovercraft in the world took to the water this week for its first trial. Built by the British Hovercraft Corporation at Cowes, the hovercraft is called the SRN 4, or, more grandly, the first of the Mountbatten class. It will be used as a cross-Channel ferry by British Rail and by the Swedish firm Hoverlloyd, carrying 254 passengers and 30 cars, or 600 passengers. Despite unpleasant weather conditions for the launching, the four-engined craft got away successfully, and, it seems, comparatively quietly, although so long as hovercraft are propelled by large aero engines driving propellers they are never likely to compete for quietness with muffled oars. The launching is a great moment for those who have supported the development of hovercraft in Britain, and for their inventor, Mr Christopher Cockerell, who was there to see it happen.

Sadly, it is not quite so cheerful a moment for the

design staff of the British Hovercraft Corporation. The company announced this week that 40 members of the design staff working at Hitchen will be laid off over the next 2 months. The reason for this, the company says, is twofold. At the end of 1967, a number of projects which the company had hoped to start work on at Hitchen and Cowes failed to materialize. Coupled with the cuts which the Ministry of Defence has made, this has meant that design staff will have to go. Some, it is hoped, will be found work with Westland Aircraft (one of the two major shareholders in BHC). At Cowes, there should be sufficient work to sustain the design team.

School Mathematics

THE report of the director of the School Mathematics Project for 1966-67 has a cheerful tale to tell about the acceptance of the new courses as qualifications for entry to universities. Dr Bryan Thwaites says that "with only one or two exceptions" all university departments of mathematics are prepared to accept as candidates for entry students with a pass in the Advanced level examination in what is called "SMP Mathematics". Even so, it seems, suspicions persist in the schools that a double dose of SMP is likely to be a safer means of being accepted than a single dose, and these suspicions seem to be borne out by the reaction of some of the universities to the new courses. Dr Thwaites says that "at least some university departments are going against the spirit of their formal acceptance . . ." by asking extra of intending students. It remains of course to be seen whether Dr Thwaites's exhortation will bring backsliding universities to heel.

To judge from what the report says, the publication programme is now virtually complete. This means that courses are available for students between 11 and 18. One innovation, however, is that the School Mathematics Project has turned itself into a trust which will presumably be able to superintend the further development of the teaching materials now available.

Undivided Seconds

from our Oxford Correspondent

RATHER surprisingly, Congregation at Oxford has reversed its decision to divide the second class degree into upper and lower parts, a proposal accepted last term by 101 votes to 99 (see *Nature*, 216, 631; 1967). This term's debate, on an opposition amendment that the division should be indefinitely postponed, was very much better attended. The debate, however, seemed somewhat confused, with members finding it hard to distinguish the germane from the irrelevant. There was a certain amount of doubt whether the original proposal had been to enlarge the second class as well as divide it, or merely to divide it—the two measures having rather different effects. The final vote for the amendment was 171-121, so that for some time at any rate Oxford will be making no official distinction between types of second class. What will happen, doubtless, is that fewer Thirds will be awarded, and that the Fourth Class will cease in practice to exist. So Oxford will be aligning its degree classes with those of other British universities while avoiding the difficulties of subdividing the second class candidates, most of whom would be on the borderline of

The SRN4 hovercraft on its first trial.