

Baccalaureate Trend Downward; More Take PSSC in High School

During 1966-67, the production of physics baccalaureates continued to decline; the fraction of bachelors who had taken the Physical Science Study Committee course in high school rose almost to one fourth; one third of the graduates came from bachelor's-granting institutions. Thus reports an American Institute of Physics preliminary survey of bachelor's recipients; AIP will confirm the data with a more complete survey in the spring.

An estimated 4900 physics majors received bachelor's degrees during 1966-67, barely 130 fewer than the year before. The estimate, if corroborated by the later AIP survey, would underscore two significant trends: (1) The total number of physics bachelors continued to decline for the third consecutive year from a peak of 5611 in 1963-64. (2) Even as fewer and fewer students were electing to become physics majors, the dropout rate (from junior to baccalaureate) increased for the second consecutive year, that is, from 27% in 1965 to 29% in 1966 to 30% in 1967. At least one break, however, is expected to relieve the downward trend; the 7345 juniors during 1966-67 were the largest crop in three years, and the number being graduated this June is expected to be correspondingly large.

"The situation is an alarming one," said AIP director of education and manpower, Arnold Strassenburg. "The downward trend in physics is a phenomenon not peculiar to the US but one that can be observed all over the free world. I believe this trend does not have so much to do with the particular style in which physics is taught (although we can do much better in this respect). It is caused rather by the prospect of our troubled times. Students are concerned with social and world problems; they do not see in physics the way to solve these problems. I think we have to convey to them that physics is relevant to social progress in the best sense."

The survey also reported that 23%

of the bachelor's recipients took the PSSC course in high school, while 71% took the traditional physics course and 6% took no physics in high school. The distribution for 1965-66 was 16%, 78% and 6%, respectively. In addition, 32% of the bachelors came from bachelor's-granting institutions, 16% from master's-granting schools and 51% from PhD institutions. Postbaccalaureate plans included physics graduate study (55%), other graduate study (19%) and full-time employment (26%).

Rain or Shine, Farmers Assail Cloud Physicist

The farmers in downstate Pennsylvania, little impressed with the image of science, have recently been up in arms against cloud physicist Charles Hosler, dean of the College of Earth and Mineral Sciences at Pennsylvania State University. They charge that Hosler's research in cloud development and precipitation, over 50 miles away, has resulted in excessive

RESONANCES

Major accelerator and reactor projects will not be appreciably affected as a result of the 10% reduction in programs ordered by the President for fiscal 1968. The AEC budget office reported that though commitment authority to spend funds has been deferred to some degree, "anything that is actively under construction we are going to keep on schedule, and, on architectural and engineering work, we will go full speed."

Strengths and weaknesses of US science are assessed in a report by the Organization for Economic Cooperation and Development. Some conclusions are: While intense competition for funds, prestige and quick results has made US science extraordinarily productive, it is for many a hectic "rat race", leaving little room for bold departures from theory. The decision-making machinery is exceedingly effective in programming development of particular disciplines, but huge sums are sometimes spent on prestige projects at the expense of vital goals.

droughts, ruinous downpours, death of flora and fauna and the weakening of the fertility of eagles. The scientist, who is currently studying the snow showers over the Great Lakes, takes exception to these charges.

It all started seven years ago when the orchardists signed a hail-prevention agreement with a private contractor, Hosler told *PHYSICS TODAY*. Whether the contractor, with his silver-iodide generators, actually prevented hail formation is uncertain, but some time after he had begun his program, a severe drought afflicted the entire northeast part of the US. The dairy farmers, presuming cause and effect, believed the seeding was bringing on the drought. At this point a lawyer for the orchardists contacted Hosler, asking the scientist to explain to the farmers just what cloud seeding could and could not do. "I went down and told the dairymen that the drought was caused by large-scale atmospheric motions and not by seeding," says Hosler.

But the drought continued, and the contractor (and his successor) left;

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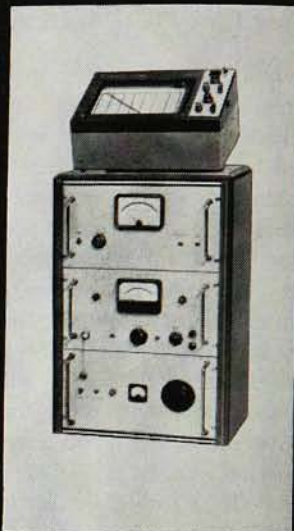
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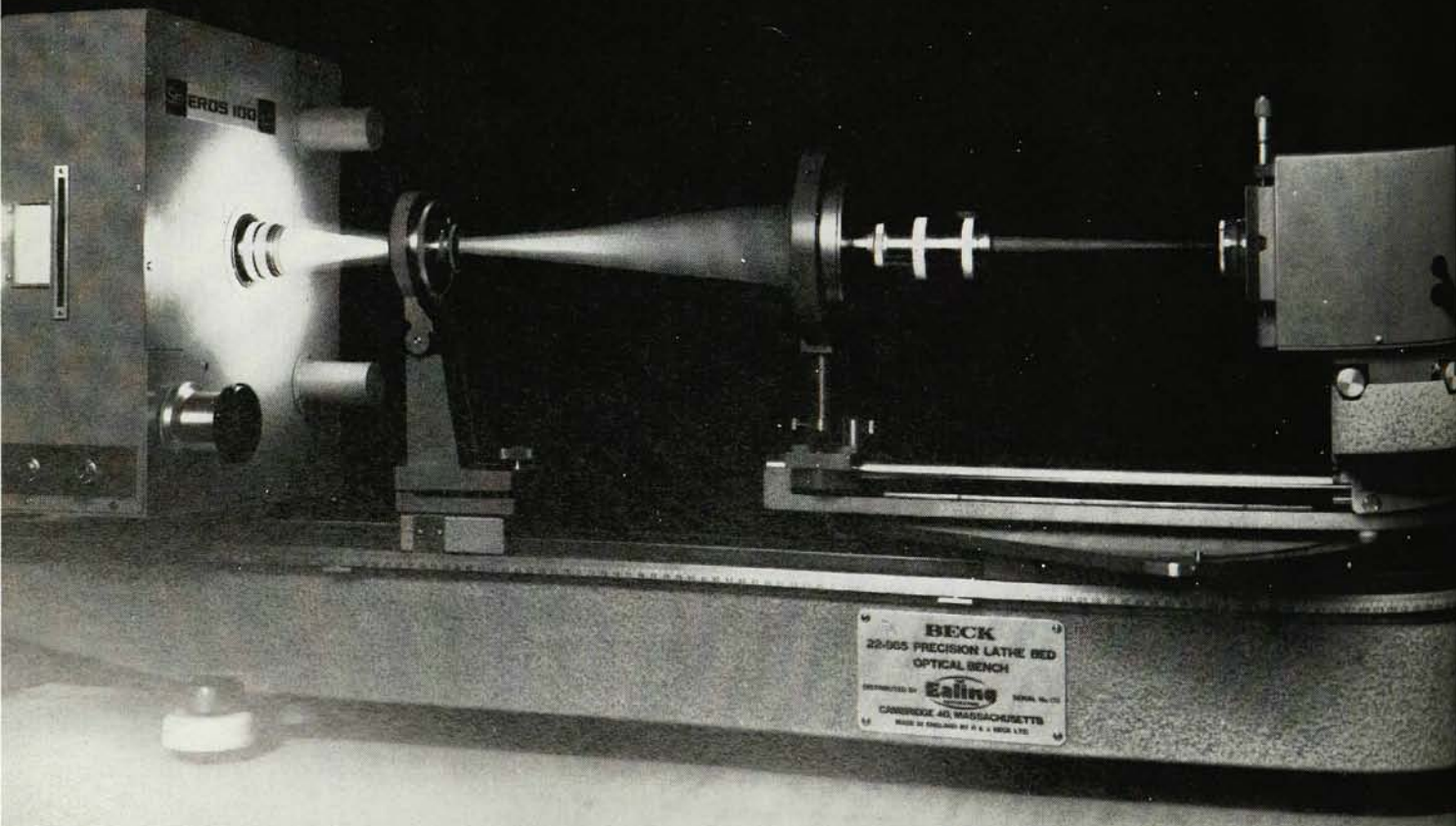
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the dairymen, discovering that Hosler had talked with the orchardists, assumed that he was the scoundrel fouling up the weather. "It was their logical conclusion," says Hosler. "They reasoned, 'All the commercial people have stopped but the drought continues; therefore it must be that fellow at Penn State. He still has the research program.'"

Subsequently, when a heavy rainfall drenched the area, the dairymen blamed Hosler for that too. "They blame me for anything they think shouldn't happen. One says I've destroyed the fertility of their eagles, another says it's not cigarette smoking but my cloud experiments that cause their emphysema. One individual claimed that he was burned by chemical agents that cloud seeding had deposited on vegetation (he probably had poison ivy). They feel that somehow the scientists, the professors, the government, are conspiring against them."

In the meantime, Hosler is continuing his research at Penn State. His group is devising mathematical models of clouds and cloud systems, trying to determine some of the parameters that

enter into the development of precipitation. With such a model, they can modify those parameters which are within the realm of artificial manipulation, such as a colloidal state or phase transition. Most recently they have investigated the heavy snow showers that plague the shores of the Great Lakes. By altering the size and shape of the snow flakes, they will attempt to give them flatter trajectories, thus causing the snow to be deposited over a wider area downwind rather than in clumps along the shore. The US Weather Bureau, the Environmental Science Services Administration and the National Science Foundation are sponsoring the project. Penn State, Cornell Aeronautical Laboratory and the State University of New York at Albany are participating.

"This project will be experimental in nature and will cover a short period to check the models and theory," says Hosler. "It will not be an operation designed actually to move the snow over a long time period. Even so, it is hoped that before any cloud modification is done next winter, we will have the opportunity to explain it to local officials and the public so that they understand that we are not about to change their weather but are only trying to find out if we can. If it works, then the scientific question is answered; whether the potential weather control is exploited is a local matter."

The Pennsylvania dairymen, meanwhile, have lobbied to introduce a bill into the state house of representatives that would have effectively prevented any future cloud-seeding experiments. The bill passed, but was amended in the state senate to be primarily regulatory, and in the new form it was enacted into law. Pennsylvania now joins 22 other states that have regulated weather-modification activities.

SLAC Blends Physics With the Environment

Just a few months ago, the citizens of Woodside, Cal., were up in arms over the AEC plan for stringing a 200-kV line on conventional four-legged structures to feed the Stanford University 20-GeV linear accelerator. While west-coast physicists wrung

their hands fearing a public outcry against an often maligned high-energy physics, the commission and its scientists and architects got busy to devise a plan for placating the citizenry.

Tapered steel poles, 48 to 94 ft tall, painted a dull light green, and light gray insulators were blended into the landscape. Corona-rings and line hardware were selected for minimum radio-interference voltage, thus eliminating radio noise at residences and at a radio-astronomy laboratory close by. Great care was also taken to reduce damage to foliage and terrain. A helicopter carried materials and set poles at sites not accessible to cranes. At the same time, a conductor corridor was avoided by angular routing through the hills and trimming trees in an irregular manner.

The result of such efforts has been to win the approbation of the Woodside denizenry and enter a small plus mark in the public attitude to high-energy physics.

NSF Gives AIP Grant to Build National Information System

The American Institute of Physics has received an initial grant of \$239 300 from the National Science Foundation to begin development of a national scientific information system in physics and astronomy. This is the initial funding of a long-term project for which a total NSF grant of \$1 180 000 has been requested. AIP director H. William Koch will be the program's principal investigator; its staff of more than 30 will include computer, scientific and other professional personnel.

In implementing this program, AIP will study all aspects of the communication of physics knowledge—traditional publication, written informal communications, use of the telephone, laboratory visits, professional meetings, use of abstracting services, specialized bibliographies, computer retrieval, etc. It will study means of improving such "creative simplifications" as condensations, indexes, reviews and compilations of evaluated data. The program will have two main parts: (1) the analysis and retrieval of physics information—to develop means for identifying and searching for pertinent material, and (2) the analysis and devel-



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