

6. Other Academic Pursuits (1940s-1970s)

Military Training, World War II

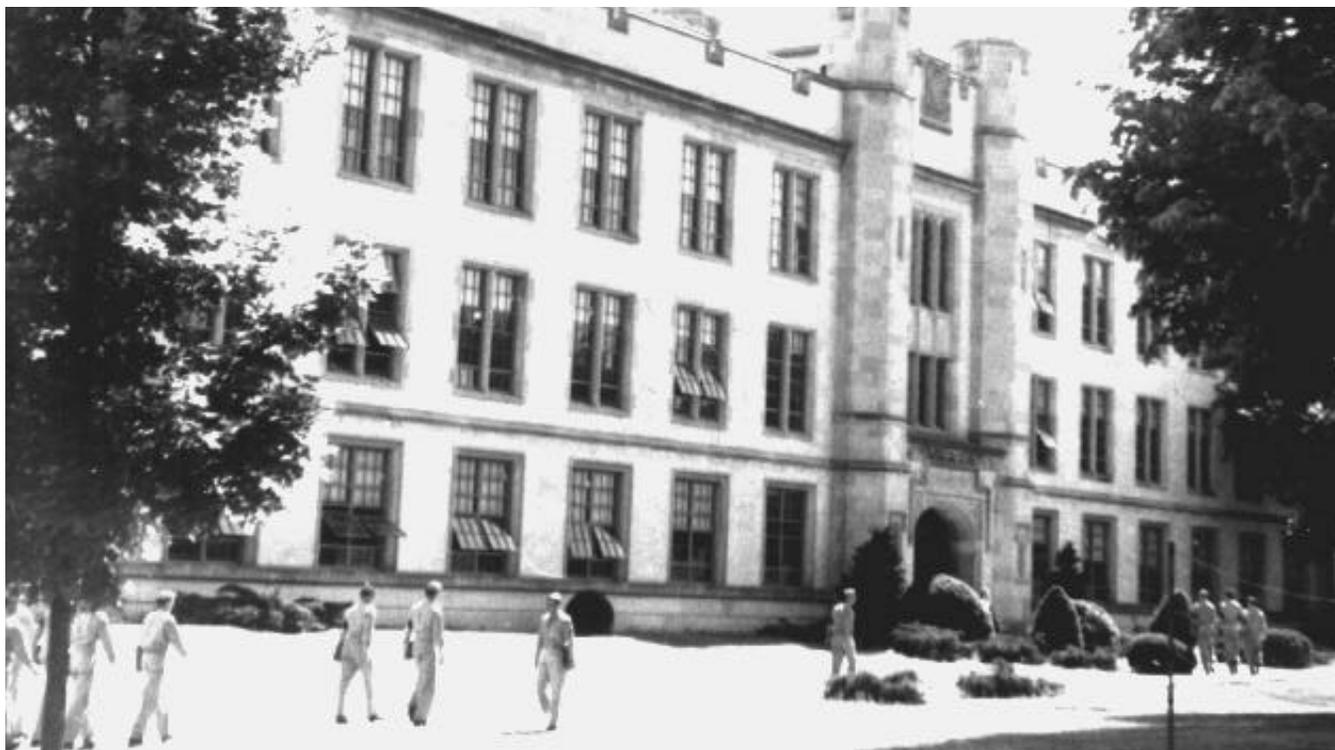
Beginning in 1942 and for the next three years the impact of World War II had a great effect on the University. Student enrollment dropped by approximately 30% so that the regular civilian student body numbered as low as 1792 in 1945 and over one-half of these were women (Ref. 2, p. 159). Many of the young men had been called or had volunteered for military service.

Then in 1943, 1944, and 1945 Army Air Corps and Army Specialized Training Programs came to the campus. As many as 3,500 students in uniform may have been trained here (Ref. 2, p. 215). The Physics Department had some early experience teaching physics to Civilian Pilot Training students in special night classes. Then the young Army Air Corp volunteers arrived in 1943! The first three groups were Squadrons A, B, and C with one hundred fifty each. Ham, Sharrah and Dr. Charles H. Cross, physics instructor from Peabody High School in the

College of Education, gave the daily lectures in physics to these three groups. The lectures were in the Engineering auditorium in the old Engineering building on the southeast corner of the campus. The text was College Physics by O. M. Stewart of the University of Missouri.

These students also performed rather classical physics laboratory work and attended drills. Ham organized all of this and a large number of faculty members from the other departments and colleges came in to do this work. The advanced laboratories downstairs in Old Main were converted to elementary laboratories. Dr. R. K. Bent of education helped to arrange the equipment storage. Some new items were purchased with military funds. If you see some ancient pieces around the Physics Department with an "A" roughly painted on it, it was purchased by the Army then.

Harold Clark held weekly discussion sessions attended by all the faculty brought in from the



Some students in the Army Specialized Training Program returning rather informally to barracks after attending a class. Sections often marched to and from class. Chemistry Building is in the background. (ca 1944)



Charles W. Oxford (ChemE) was an instructor in physics during WWII before joining the Navy and later became vice president of the University.

other departments for the Army Air Corps Program and later for the Army Specialized Training Program. He described the experiments and went through most of them and worked selected problems from the Stewart text and answered questions. All of this was well organized by Ham and most of the things went through smoothly. Many of the staff brought in from the other departments spent long night hours studying

physics again!

When these Army Air Corps Cadets reported to their classes, they were usually brought by one of the Lieutenants, and later by the group leaders. A Lieutenant Montgomery sat in on most of the lecture sessions for one squadron. They would stand at attention until the physics instructor would tell the officer in charge to seat them. This military formality didn't last very long and things became much more relaxed soon. But the groups did come and leave in formation, often singing the Air Corps Song "—Nothing Can Stop The Army Air Corps—". Sometimes one would hear "the WACS and WAVES will win the war, what the hell are we fighting for——":. The physics department has a short movie of one of the groups marching to class.

There was a feeling at times that the Army was using us to hold these Army Air Corps volunteers until they had planes and training space for them. Most of these volunteers were very young and, while they were bright and eager, they had much to learn. We did them some good, I hope. Someone, somewhere in the United States should have made the young navi-



J. B. Kellar was an instructor during World War II. He went on to become assistant registrar.

gator of the Lady Be Good study a little harder!

Then later in 1943, when we had just about figured out how to teach young Army Air Corps volunteers, here came the Army Specialized Training Program. Then we heard a new song "Those Caissons Go Rolling Along". It appeared now that the Army was expecting a long war. They were becoming concerned about the lack of personnel with mathematics and engineering training.

It was obvious that the ASTP students had been selected very carefully as to academic background and potential. We taught them a course more typical of Engineering Physics with a text chosen with this in mind. The author was Robson. The work was more mathematical than the course taught for the Army Air Corps cadets.

Most of the ASTP students took to this work very well. It was clear that if they didn't make it they would be out of the program soon. Some did leave. I remember the face of one very bright ASTP student who was quite literary and artistic. He said that he really didn't want to learn the slide rule and trigonometry and physics!. He was smart, he did. It was reported later that many of these trainees made the difference at the Battle of the Bulge.

Fifteen credit hours was considered the normal teaching load for several years but a twelve-hour normal load was well established by the middle of the 1950s. When the members of the physics faculty were teaching very heavy loads above twenty hours during WWII, the University (the Army) paid all of them a fifty percent increase in pay! The extra load came about because of the Army Air Corps and Army Specialized Training programs. But it was very hard work and one of the physics teachers came down with pneumonia probably brought on by fatigue!

Summer Sessions and Air Conditioning

One day in late 1952 or early 1953, Dr. Henry Kronenberg, Dean of Education and Director of the summer session, walked into the physics office on Dickson street and reported to Dr. L. B. Ham that he wanted college physics to be offered again during the summer session. He preferred to walk to the various offices to do business rather than use the telephone or send

memos!

For some unknown reason physics had not been taught for one or two summers. Dr. Sharrah was quick to agree that this should be renewed but complained about how hot the rooms were in the summer in the Dickson Street Building without air conditioning.

Dean V. W. Adkisson had something to do with this question and said that we did not really need air conditioning here in the cool Ozarks! His office was a nice southeast corner room in Old Main with many windows! Physics was down in a hot hole south of Dickson Street where there was very little breeze.

The physics department did prevail and Room 1 in the northwest corner of the basement was air-conditioned and became the primary lecture room and laboratory room for much of the summer teaching during the 1950's and into the 1960's.

The teaching laboratories and the research laboratories also were gradually cooled as needed, usually by window units. The lecture room (Room 119) and library and planetarium were placed on special units installed in the 1960's and 1970's.

Joking, but often in truth, it was said that the research equipment needed coolers to reduce the humidity in the laboratories! The research staff certainly worked more efficiently also in rooms with reasonable temperature and relative humidity values!

The main office and the planetarium and a few of the research laboratories were actually connected to the main cooling equipment providing chilled water from the physical plant facility next to physics in the 1970's.

All of this seems trivial now because all new buildings and most of the older buildings are being provided not only with modern heating systems but also with modern central cooling systems without question.

The summer-school offerings have included not only college physics but university physics, astronomy, physical science, physics and human affairs, and university physics III. Details of the offerings have changed from year to year, but physics has been a part of the summer school since Kronenberg got us together again in the 1950's!



Marsh W. White of Pennsylvania State University was Invited Speaker at one of the Summer Institutes. This was his second visit to Fayetteville as he had been here to install the local chapter of Sigma Pi Sigma in 1948.

The summer has also been an important period for the staff and graduate students to get valuable work done. They have made research truly a year-around activity. The summers are no longer relatively quiet like they were in earlier years.

Summer School Teachers

But Sharrah went to the Oak Ridge National Laboratory several summers and Ham liked his long summer vacations, seeking a place where Mrs. Ham's health might improve. Some very fine teachers were brought in from other institutions to teach college physics in the summer school. Among these were Dr. Joe G. Robbins of Hendrix College, Dr. Wallace A. Hilton and Dr. Roger Crawford of William Jewell College, Dr. Moody Coffman of Oklahoma City University, Lamont Woodruff of Hendrix College, and Dr. Roger Hanson of Carlton College.

The department continued to bring in outside teachers for the elementary physics courses even through the 1960's because it became involved in summer science institutes and used some of it's key teaching faculty in these insti-



Group of high school chemistry and physics teachers in an AEC/NSF-sponsored Summer Institute in 1967.

tutes. Dr. Paul C. Sharrah, Dr. Charles E. Jones and Dr. Charles B. Richardson contributed to these institutes in the 1960's and Dr. Richard J. Anderson and James Wisman of Chemistry worked with institutes for high school students during the 1970's.

Institute Teachers

Not only were outside teachers brought in during the 1960's and 1970's to teach the principal offerings of the summer school, but teachers from other schools were employed to assist with the science institutes. Wallace A. Hilton was the backbone of the optics laboratory work taught as a part of the Institutes sponsored jointly by the Atomic Energy Commission and the National Science Foundation. These jointly sponsored institutes were in operation from 1963 to 1971 and were for high school teachers of chemistry and physics.

Noel Rowbotham of the College of the Ozarks helped develop laboratory experiments. Moody Coffman of Oklahoma City University helped one summer with the junior high school science teachers in addition to teaching in the regular session one summer. JoAnne Rife of Harrison High School assisted in the AEC/NSF institutes and Sallylee Hines of the College of Education assisted in the institute for junior high school science teachers.

One year special Saturday morning lectures for the junior high school science teachers were

conducted at five locations in Arkansas. Moody Coffman came from Oklahoma City to Ft. Smith Junior College and Professor Powers came from Monroe Louisiana to the University of Arkansas at Monticello. Three other teachers whose files have been lost taught on Saturday mornings at Arkansas State University in Jonesboro, the University of Arkansas at Little Rock and in Fayetteville.



Lamont Woodruff using telephone in Room 2, the temporary physics office, ca 1963.

Several physics graduate students and some undergraduate students were employed to assist in various parts of the institute work. Some of the students recalled were John Gray, Charles Thorne, Carl Rutledge, Onis Cogburn, Charles Head, Martha Moore, Mordecai Schwartz, Sam Donaldson, Robert Hilton and Thomas Atwood.

Summer Institutes

The first NSF institute on campus was an excellent program directed by Dr. Lowell Bailey and later by Dr. Leo Paulissen of the Department of Botany and Bacteriology. This institute was in operation for ten consecutive summers, beginning in 1956. Dr. Bailey had been assisted and encouraged by Dr. Arthur Fry of the Department of Chemistry in the initiating of this program.

This institute brought in approximately fifty high school science teachers for six weeks. They had courses in all the basic sciences and all took a three credit-hour course in demonstrations in physics. Glenn Bray of Grosse Point High School was brought in specifically to assist Paul C. Sharrah with this course. Several high-school students and college students assisted in the development of these demonstrations.

All of the offerings were designed to meet the needs of the high school teachers and were offered for graduate credit. In addition to the physics demonstrations course, an additional eight credit-hour course was offered entitled Principles of Physics. This was an algebra-trigonometry based general physics course.

Of course some complained that we were giving graduate credit for such courses, but they were indeed designed to meet a need and were definitely challenging.

M.S. in Natural Science

It was about 1960 when Dr. Bailey took the lead in developing a graduate program resulting in the Master of Science in Natural Science degree. It again was a program designed to broadly train the recipient in the sciences and mathematics. A number of these degrees were awarded to high school teachers in the 1960's and 1970's and several of the students with physics emphasis have had outstanding careers.

Someone in the physics department is always saying that each decade has its challenge and it's opportunity. We met the challenge with the institutes and the MSNS degree. This degree was phased out later when it was felt that it had served its need.

Modern Physics Institute

Then in 1963 the department of physics oper-

ated for the first time an institute funded jointly by the Atomic Energy Commission and the National Science Foundation entitled "Atomic and Nuclear Physics for High School Teachers of Chemistry and Physics." The initial proposal was written by Paul C. Sharrah and Glen T. Clayton. Paul C. Sharrah directed these institutes from 1963 to 1971. The principal teachers in these institutes were Charles E. Jones, Charles B. Richardson, and Wallace A. Hilton. The publicity for this institute was sent out nationwide so that a few of the participants each year came some distance. The NSF provided the participant stipends and the AEC provided the salary money and other essential funding. This institute was limited to approximately twenty participants because one half of the work was a serious laboratory course emphasizing atomic and nuclear physics, including classical optics and spectroscopy.

The other half was a lecture course on Atomic and Nuclear Physics. This lecture course was effective, taught first by Charles E. Jones and in the institute's final year of 1971 by Paul C. Sharrah. Charles B. Richardson, Lamont Woodruff, Wallace A. Hilton, Carl T. Rutledge and JoAnne Rife of Harrison High School were key persons in the laboratory work.

The laboratory had been enriched by an AEC equipment grant, including a subcritical assembly, received earlier to fortify the nuclear offering. This subcritical assembly was presented later to the nuclear program in mechanical engineering under the direction of Dr. Leon West, a former physics major here.

Also a significant part of the AEC/NSF institute program was an equipment grant from the AEC to each participant completing the course. This was a desk top radiation detecting system using a Geiger counter and a scaling circuit, an ionization radiation detector of simple design, several sources and filters and other accessories. It was stimulating the last day to see the participants coming to the back door of the physics building in their cars to load up this equipment they had been using during the six week course. Some equipment had to be shipped. Two of the participants were so impressed by Arkansas that one came to work in chemistry and one retired later to Beaver Lake.



NSF-sponsored institute in physics for junior high school science teachers in 1965. This was a demonstration period. Note the video camera on loan from the speech and dramatic arts department.

We were very successful in obtaining AEC and NSF funding for summer institutes. Glen T. Clayton assisted materially in the writing of the proposals and in contributing ideas. We were so successful that Moody Coffman of Oklahoma City University wanted to know more about our proposals. Part of our success was a result of the desire on the part of the National Science Foundation to have institutes widely distributed among the States, and we were ready and willing.

The recent AEC equipment grant obtained by Dr. O. H. Zinke also was a factor in obtaining the joint AEC/NSF institute grants.

The director of the NSF institutes program, a former chemistry professor at Illinois, was an alert and imaginative person. More than once he called, usually in the late afternoon, with a specific pertinent question about our program and made inquiry about our work.

He must have been reasonably well impressed with our work because, after Sharrah returned from teaching in India in 1967, he corresponded with him concerning the possibility of having an appointment with the NSF to work with the AID and the India program. Approximately twenty

years later Dr. Richard J. Anderson did go to Washington in another type of NSF program!

Training Directors

A very important feature of the NSF institute program was the meeting for institute directors. All of the directors from the different colleges or universities in a broad geographical region were convened sometime in the late winter or early spring for detailed information on institute management and participant selection. It was one long day and all the directors went home with practical management information and increased confidence.

There were fewer of the AEC/NSF sponsored institutes, approximately twenty.

Most of the jointly sponsored AEC/NSF institutes were directed by biology teachers with the remainder being in chemistry and physics departments. In addition to the NSF directors training sessions, all of these directors were brought together in one place, sometimes Atlanta, or Albuquerque, or San Juan, or New Orleans, etc. About one-half of the day again was given over to management considerations but the other half was spent in much needed



Teaching staff and assistants at NSF Summer Conference for Junior High School Science Teachers in 1965. Shown are, front row, left to right: Darrell Collier, James Crawford, Carl Rutledge, Tom Atwood, and Robert Hilton; back row, left to right: Darrell Bolding, Noel Rowbotham, Moody L. Coffman, W. A. Hilton, Paul C. Sharrah, and L. V. Woodruff.

scientific and technical discussions. This included detailed information on the nuclear laboratory equipment which was to be delivered for the participants to use in the institute and to take back to their high school.

Some interesting near-by nuclear facility was visited. Sometimes this was a hospital and at other times it was a University research laboratory, as at the University of Puerto Rico Medical Center.

Junior High School Teachers

Mentioned earlier was an institute funded in 1965 by the NSF entitled "Physics for Junior High School Science Teachers." It consisted of a three week summer session followed by an in-service course offered throughout the next year at five different centers in Arkansas.

The summer portion was a laboratory course and a demonstration lecture each day, emphasizing physics principles and phenomena. The demonstrations were essentially the ones used during the the years of the NSF institute directed by Lowell Bailey and Leo Paulissen. The laboratory work leaned heavily on the general physical science offering in the department.

Then during the following school year several of the teachers continued their studies in the in-service course taught at five locations. This in-service course was a lecture course emphasizing

physics principles and phenomena. Two textbooks were used. One was a recently published junior high school text emphasizing physics and the other was a brief general physics text (Beiser). The five centers where these in-service courses were taught were the Ft. Smith Junior College, the University of Arkansas at Monticello, the Arkansas State University in Jonesboro, the University of Arkansas at Little Rock and in the University of Arkansas at Fayetteville. The institute director (Paul C. Sharrah) or associate director (Glen T. Clayton) visited each of these five sites at least once during the school year.

This program for junior high school teacher of science, while considered to be a success, was not proposed again the next year primarily because of the great amount of time required to initiate and manage it.

Students and Teachers

An excellent series of institutes and summer science camps were in operation by Dr. Richard J. Anderson from 1971 to 1977 and are best described in his own words quoting from a December 1992 memo.

"During the periods of the 1970's the physics faculty continued their involvement with teacher education and expanded their efforts to include summer programs for high ability stu-

dents from small rural school systems within Arkansas. Professor Richard Anderson's first effort in teacher training was as a staff member on an NSF-funded project directed by Dr. Sally Lee Hines of the College of Education.

"This 1971 project provided a six-week summer workshop for twenty-four junior high school teachers from the Northwest Arkansas area. The participants were introduced to the Introductory Physical Science Curriculum (IPS), a ninth-grade course that emphasized the "discovery" approach. The participating schools agreed to purchase the necessary equipment for all the teachers to implement the curriculum during the following school year. Follow-up meetings were held during the academic year to ensure that the participants were successful in their efforts.

"This program was significant in several ways. First, it marked a significant commitment on the part of the school system to implement the curriculum training received by the teachers (e.g., equipment purchase and academic year follow-up meetings).

"Second, teachers actually "took" the course that they were to teach while university faculty "played" the role of the junior high teacher.

"Third, it introduced the physics faculty to a curriculum that was essentially the sole purview of the college of education. This last point was especially significant because it led directly to the development of the Department's highly successful Physical Science Course for prospective elementary school teachers by Dr. Glen T. Clayton. Clayton's course utilized the IPS materials and "discovery" approach, but added several enrichment experiments and displayed significant physical principles in a way that was "fun" for the teachers (e.g., making ice cream as a freezing-melting point experiment). The increase in volume of pop-corn was studied! This provided another example of how the Department's summer educational programs impacted the Department's regular academic year offerings.

"In 1973-74 Anderson received NSF support for curriculum implementation programs involving high school physics teachers from across the state. The programs were designed to assist school systems, including Fayetteville, Fort

Smith, and Pulaski County, to introduce the Harvard Project Physics Curriculum into their senior high class rooms. Anderson was assisted by a high school teacher from Little Rock's Hall High School, Mr. A. T. Bell. Bell received training at a workshop conducted by Harvard University before joining the program. These summer programs were also characterized by supplementary academic year meetings; a requirement that the school district purchase the necessary texts and laboratory equipment; and a "hands on" classroom approach to the summer training period.

"Perhaps one of the most interesting outcomes of the summer Harvard Project Physics workshops occurred in 1974 when Anderson and James Wisman, Lecturer in the Department of Chemistry, obtained an NSF grant and solicited private donations to conduct a Student Science Training Program (SSTP) for 24 high ability students from small rural school systems. The six-week SSTP was timed to "overlap" by one week with the teacher workshop so that the twenty-four teachers, participating in the workshop, could try out their new-found techniques on the students. The result was a "one-on-one" learning experience that few other students would ever experience.

"The SSTP "summer science camp" concept that Anderson and Wisman initiated was repeated each year during the four-year period 1974-77. The programs varied in length from six to four weeks, but the format, sans high school teachers, remained the same. Each week students were introduced to topics in astronomy, environmental chemistry, computer literacy and physics (e.g. optics, atomic and nuclear, sound and electronics). The emphasis was placed on student projects that provided innovative "hands-on" experience. For example, one of the sessions included a visually-impaired student from the Arkansas School for the Blind (Little Rock); an opportunity to examine new approaches to teaching a "visual" subject such as observational astronomy to a student who could not observe. The SSTP staff and participants accepted the challenge and working together developed various activities that all of the students could participate in.

"One such activity of note involved using the

microwave transmitters and receivers from the Sargent-Welch microwave optics apparatus to set up an experiment in Radio Astronomy. Several microwave sources were set up around the room, one on a rotating turntable. The participants were given microwave receivers with audio signal capability and with the exception of the visually impaired student, each student was blindfolded before entering the room. Teams of students were placed around the room and each asked to "map" the "universe" that they "discovered" based upon their analysis of the observed microwave signals. The experiment yielded surprisingly good results, but most importantly the visually impaired student became a valuable contributor to the project.

"The SSTP experiences were extremely gratifying to the faculty and graduate students involved as counselors and teachers. Especially satisfying were the follow-up academic year visits to the schools. Wisman and Anderson would rent a trailer, load it with laboratory demonstrations and travel to select schools for Saturday science sessions with the participants and their classmates. Both of us learned a great deal about the status of science education in the

smaller rural schools in the state.

"The Student Science Training Program was discontinued after four years of operation due to several factors including: an increased emphasis upon research within the College of Arts and Sciences; decreasing NSF support for the national program; and to a certain degree staff burnout (handling twenty-four high-spirited high school juniors for 24 hours per day, seven days per week was not an easy task). In spite of continued student interest at the time of its termination, neither Anderson nor Wisman could interest any of their faculty colleagues to pick up the "torch" and continue the program."

The above is a part of a December 1992 memo from Dr. Richard J. Anderson.

Summary

We continue to quote from the December 1992 "memo" from Dr. Richard J. Anderson.

"Many of the SSTP alumni went on to earn college and advanced degrees and one, Dr. Ramona Bates, became a physics honor graduate. It is interesting to note that the NSF recently re-instituted this most successful program on an expanded scale as a summer science

camp initiative.

"The legacy of the teacher training and SSTP programs shaped the Department's relationship with many of the state's school systems, their teachers and students for many years afterward."

The above paragraphs are quoted with only small editorial changes from material submitted by Richard J. Anderson in December 1992.

The work with the participants in the institutes was certainly one of the most rewarding experiences anyone interesting in teaching could have. Let us never cease to sharpen our tools as teachers. There is always plenty of room for improvement. Always!

The summer science institutes were certainly a major thrust but the regular summer school program continued to serve the needs of the students. Introductory courses were being taught and astronomy and physical science courses were popular.

A few intermediate and advanced courses have been offered also and research is certainly a major activity for the graduate students and the faculty in the summer.

The research grants assisted with the support of the graduate students in the summer and also the faculty frequently had part or all of their salary paid by the grant.

In conclusion, it is estimated that in the neighborhood of 800 teachers may have been involved in all of the above institutes from 1956 to 1977. Approximately 100 high school students also profited by the summer science camps.

Also, while the summer institutes were originally conceived as a way to be of assistance to the science teachers, the good relations established with the teachers and the schools and the principals definitely assisted the physics department to obtain many good physics majors. The high-school student or college freshman merely came by to see us and said, "I want to major in physics!" Frequently they would mention the name of the teacher who recommended that they come to see us.