Berlin, hard-working and persevering as they may be, are unable to cope with this endless river of misery and want. Although there are public funds for the expensive and often dangerous air transportation of these refugees into the western part of Germany, the waiting period in Berlin is costly and tedious, and often long.

The burden of refugees and unemployed upon the budget of the city is reflected at the University in decreased funds for scientific books, supplies, and apparatus. West Berlin supports the University by tax money. We are profoundly grateful for the many and magnanimous donations, above all of books and expensive apparatus, which American philanthropy has sent us through both private and official channels.

There are many students among the refugees from Eastern Zone. They come with hope and great expectations because they know that the Free University was created for those who want to study as free men and not under the yoke of a doctrine. Of course, we cannot admit all of them; their number is far too great, and we have to insist on the same scholastic standards for applicants from both East and West Berlin. It is often heart-rending to see the plight of these hopeful young men and not be able to help them. I remember many penniless students who had walked long distances to escape from the East. I have had to give them money to make a phone call to friends, to be able to ride the streetcar or to buy bread. Most of our students have no support from their parents, but are forced to apply for scholarships, to work part-time, or both. I understand that many of the American students support themselves. However, it is infinitely more difficult for a student in Berlin to find part-time work with decent pay. Harassed by worry about his daily bread, he has too little time for study and too little money for buying books. He also suffers from a mediocre and deficient grammar school and high school training. The level of such training was deplorably low under the Hitler regime, and it can be improved only gradually because good teachers are scarce. In spite of all this, the average scholastic achievements of our students are satisfactory. Performances of the best students of the class appear, fortunately, to be comparable to those in former classes.

Interest in science is lively, although often overshadowed by worry about the future. It is my impression that, compared to the ground swell of optimism I find in America, the attitude of our students toward their future is often pessimistic. Therefore, quite a few young men, often the most promising, wish to emigrate, especially to America, where they hope to find better opportunities. Apart from practical reasons, the interest in the countries of the Western World, in their people, and their ways of living is great. Every opportunity to meet with foreign students and visitors from the West is eagerly sought. Foreign visitors, students and professors alike, are welcomed and invited to discussion groups whenever it is possible. This constitutes a sharp reversal from the days of Hitler's propaganda, which antagonized and defamed everything originating outside Germany. It has become only too clear, how false and irrational his insularity and chauvinism were.

The Free University does not tolerate anti-Semitic tendencies. Occasionally one hears mention of a revival of anti-Semitism in West Germany. I have not seen evidence of it. I know for certain that our University views with suspicion anyone with anti-Semitic attitudes. Jewish men and women take an equal and successful part in the leadership of the student organizations.

Our students have actively resisted all attempts to reintroduce the dueling organizations. Regulations of the Free University expressly forbid the revival of such long-outmoded customs, although the students have the democratic right and privilege to organize clubs and athletic activities of all other kinds. I am confident that professors and students at Berlin will maintain a clearly progressive attitude and resist any reversion to undemocratic customs.

Naturally, it is a great help to all of us to see that large parts of this earth are ruled by tolerance and love of freedom. This explains my happiness in speaking to our American colleagues, to whom we of the Free University of Berlin feel akin.

Those Flying Saucers

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RECENT articles on saucers (SCIENCE, 116, 640, 693 [1952], *Griffith Observer,* XVI, 138 [1952]) fail to mention the fact that a satisfactory explanation for the original and typical saucer was published soon after the first reports were given prominence in the press, and again at later times. The new book debunking the saucer stories (*Flying Saucers,* vii, by Donald H. Menzel, 1953) includes "distant planes, jet aircraft" in a list of material objects responsible for saucer reports, but the list includes objects which do not produce the typical saucer and have never been reported to me as saucers.

The typical saucer is seen only on clear days and has the appearance of a round or oval disk of bright aluminum. Perhaps the most widely circulated of the

early explanations was that of the late Howard W. Blakeslee, Science Editor of the Associated Press. He wrote that he and others had seen airplanes, in reflecting the light of the sun, produce perfect saucers, with no sign of the outline of the plane showing.

As my research work on spectacular meteors depends on reports from the general public, I have received dozens of reports on flying saucers and strange lights. The bright silvery disk is always called a "saucer." The use of the word saucer for any other "strange light" or object in the sky is rare.

In the summer of 1948, I saw a group of conspicuous saucers, and verified that they were produced by metal planes by driving toward them. Persons reporting to me have found the saucers were produced by planes by driving toward them as I did, or occasionally by using binoculars. Another check which I have made is to call the airport when the saucer is seen, and verify that a plane is maneuvering in that area. A few saucers reported to me have been produced by birds. The glistening white breast of a hawk seen from the critical angle with the sun may shine as a "saucer" when flying, or as a "tin can" when the bird is sitting on a post. It should be noted that a plane may be quite close enough to be seen as a plane and heard, and yet suddenly become a "saucer" with a change in direction of travel. A hawk may be easily recognized with the naked eye, and suddenly become a saucer when it changes direction of flight.

As these saucers are simply reflected sunlight, they have the following characteristics: (1) they are seen only when the sun is shining ;(2) they are generally seen in the part of the sky opposite the sun; (3) there is only one sighting on each saucer, as the area for the critical angle is small; and (4) the saucer may disappear suddenly when the plane turns: it may reappear again at a different level.

The fact that I receive scores, even hundreds of reports on a bright meteor, but only one on a saucer, shows in itself that the saucers are not space ships, enemy projectiles, or secret weapons, but only spots of reflected light seen from the critical angle.

Turning to the magazine features, we find that, like the reports we receive more directly, there is only one sighting for each saucer. This means that figures for distance, height, and speed are mere guesses of no real value. Anyone who has had high school geometry should know this. The featured stories are very similar to those I receive, and I see no reason to doubt that if a trained person had been at hand to obtain promptly the fundamental facts and to discard the imagination and error, a simple explanation would have been found easily.

The various other stories appearing with the saucer features can be treated more briefly, since none of these is ordinarily called a saucer. The first is the fireball, or spectacular meteor, which arouses plenty of interest. I have received over 700 letters on a single fireball. As Otto Struve of the University of California pointed out (*Griffith Observer,* **XVI**, 138 [1952]), green has been and is a common color. Menzel states (*Flying Saucers,* 138, 1953), "In my opinion, any astronomer who avers that green meteors are new, or that the color must come from burning copper, cannot be much of an authority." I received hundreds of reports on green fireballs in 1952 alone. Canadian astronomers are reporting a considerable number of green meteors. An old book on meteors and meteorites shows that the green color was as common eighty years ago as it is now.

I have been called out of bed at 1:30 A.M. to explain that the bright light low in the eastern sky is the planet Jupiter. Questions on planets and bright stars are common. I receive telephone calls, occasionally long distance, and letters on balloons, on haze illuminated by flood lights or airport ceiling lights, and on the planet Venus in daylight, but none of these are reported as saucers.

An interesting report from an aeronautical engineer was that two hazy stars, one above the other, moved across the northern sky from west to east. This was evidently a mirage effect, the reflection in the sky, from a rather sharp temperature inversion layer, of the lights of a car which could not be seen directly. Another report, but from a more imaginative person, was that a brightly lighted ship appeared briefly in the sky. This may have been the inverted reflection of a bus with the interior lights turned on momentarily. Occasionally, on clear moonless nights, when a cold front is moving in, highway patrolmen report seeing what they call "goof lights." These are hazy spots of light that move across the sky with an undulatory motion. The goof lights presumably are mirage reflections from a wavy inversion layer, or layer of light haze.

As to explaining the featured stories, I learned twenty-five years ago that a prompt on-the-spot interview changes such stories surprisingly. The observer will disclaim part of the story, explaining that others added it. He will say that his wife, who was with him, claims another part of the story is imagination. From prompt interviews one gets stories which agree with the well-known laws of nature, but if one waits a year or more, the exaggerations and imagination become fixed in the minds of honest and intelligent people. I could produce from such old stories apparently good evidence for all sorts of violations of the well-known laws of nature.

To show the exaggeration possible in an apparently well-authenticated story, consider the story of the fireballs which appeared over the Regina area of Saskatchewan, Canada, on the evening of February 9, 1913, and moved southeastward across Canada and the United States passing nearly over Winnipeg, Toronto, and other important cities including New York City, thrilling and startling thousands of persons in the United States and Canada. This story has been featured in several recent magazine articles, for example, giving the number of fireballs passing along that path as 200 to 400 (*Coronet,* **XXXIII**, No. 5,

131–132 [1953]) and stating that if the fireballs had come to earth earlier, instead of plunging into the Atlantic Ocean, they would have spread fire and flame over the densely populated area between New York City and Philadelphia.

The original reports are available on this display and they show that only one real fireball appeared along that path over North America at that time. The fireball was not very large, as it disintegrated at a height of twenty-five miles near Hamilton, Ontario. This fireball and associated shooting stars attracted considerable attention in the Toronto area of Canada, but they were not travelling horizontally. They were falling downward at an angle of twenty degrees, and they were not travelling in the direction of New York City. The horizontal motion was in the general direction of Washington, D. C., rather than toward New York City. Obviously what really happened was a shower of shooting stars which was exceptionally good in the Toronto area, but attracted relatively little attention elsewhere. The only report from the densely populated New York City area was from a lady who watched the sky for a while and counted seven shooting stars. The popular story is impossible, of course; and it is evident that an excellent but unpredicted shower of shooting stars has been "blown up" into a marvelous procession of fireballs.

Because of the presence of exaggeration and error, and the absence of essential facts, in older reports I have made little attempt to investigate any reports of saucers, strange lights, or objects in the sky except when they are reported promptly, usually by telephone. For these I have found it not difficult to eliminate the imagination, obtain the essential facts, and offer an explanation which is certainly or probably true. I have always assumed that the older reports I receive, and the stories featured in the magazines could be explained as easily if one had the essential facts, freed from imagination and error. This is borne out by the new book *Flying Saucers,* previously referred to, in which a reasonable explanation is offered by Menzel for the more sensational of the stories featured by those who are trying to make a case for interplanetary space ships.

News and Notes

Meeting of the American Meteorological Society

THE 122nd National Meeting of the American Meteorological Society, which convened in Washington, D. C., on April 29, was the largest in terms of total number of registrants in the thirty-four year history of that organization. Joint sessions with the American Geophysical Union on May 4 and with the American Physical Society on May 2 undoubtedly helped to swell the total registration, which reached 516. There were many registrants from foreign countries whose governments had sent delegates to the first (April, 1953) session of the Commission on Synoptic Meteorology of the World Meteorological Organization. The latter sessions terminated in Washington on April 29, permitting many of the delegates to attend the A. M. S. meeting prior to departing for their homelands.

Highlight of the A. M. S. technical sessions was a panel discussion on the "Jet Stream," with Brig. Gen. J. J. George of Eastern Airlines as Moderator. The current status of exploration of the jet stream and of research into the causes of this phenomenon and its greater utilization in weather forecasting were discussed by researchers representing the Air Force, the Navy, the Weather Bureau, the University of Chicago, and the Canadian Meteorological Service. At an evening session devoted to the rapidly growing field of radar meteorology the first known radar photographs of a tornado vortex were described by G. E. Stout of the Illinois State Water Survey. Guest speaker at the annual Spring Dinner at the National Press Club on April 30 was George Gamow, who addressed the 272 members and guests of the American Meteorological Society on the subject "Cosmic Weather."

CONRAD P. MOOK, *General Chairman of Meeting*

U. S. Weather Bureau Consolidated Forecast Center
Washington National Airport
Washington, D. C.

American Association of Physics Teachers Meeting

THE Summer Meeting of the American Association of Physics Teachers was held June 25–27 at Pittsburgh, chiefly in the auditorium of Mellon Institute. The group was small enough to meet in single sessions and large enough to be stimulating. Parts of several sessions were devoted to short contributed papers on demonstration equipment or specific problems of presentation of pedagogical interest. Dr. R. Sutton stimulated the audience with various ticklish problems entitled "Some Teasers for Conclusion Jumpers." In addition there were four symposia: the relation of physics and medicine, the integration of high school and college level teaching of physics and the difficulty of implementing satisfactory science instruction at the high school level, the problem of the training of the very good student in high school so that he can be exempted from the elementary basic course in physics in college, and the new field of transistor physics. Tours planned for the