Mr. Eastman, of Rochester, New York. Harvey J. Burkhart, D.D.S., director of the Rochester Dental Dispensary, founded by Mr. Eastman, formally presented the building to the government and Dr. Amedeo Perna, director of the new institution, accepted it. A bust of Mr. Eastman, presented to the clinic by Italian citizens of Rochester, was unveiled by Mrs. Burkhart, following an address by Dr. Joseph Carlucci, Rochester. The Honorable John W. Garrett, ambassador from the United States to Italy, read a cable of congratulation from President Roosevelt. Premier Mussolini inspected the building during the day. The Rome clinic is the second of five dental clinics in European cities for which Mr. Eastman set aside gifts of $1,000,000 each. The first was opened in London two years ago. The corner-stone for the third, in Stockholm, was laid on April 29, at ceremonies in which the crown prince and princess of Sweden and Dr. and Mrs. Burkhart participated. It is expected that this clinic will be finished by September, 1934, and that the corner-stones for similar buildings in Paris and Brussels will be laid this autumn.

THE *Journal* of the American Medical Association reports that the All-India Institute of Hygiene and Public Health, Calcutta, a gift of the Rockefeller Foundation to the government of India, was opened recently; addresses were made by Sir John Anderson, governor of Bengal, and Lieut. Col. Alexander D. Stewart, director of the institute. The school will be operated in cooperation with the Calcutta School of Tropical Medicine, where basic subjects will continue to be taught, while the institute deals purely with public health subjects related to Indian requirements. It will later be affiliated with the University of Calcutta, through which a doctorate in public health will be offered. The building, which harmonizes with the school of tropical medicine, has four stories, with facilities for teaching, laboratory work and lectures. A number of rooms will be artificially cooled.

THE Franklin Institute of Philadelphia, on May 17, 1933, conferred a John Price Wetherill Medal on The Koppers Co., Pittsburgh, "in consideration of the development of systems for the liquid purification of gases, the success of which is evidenced by the number of such installations in regular use." The Koppers Research Department, working at the Mellon Institute and at the company's plants, developed a purification process using a liquid absorber. In this process the hydrogen sulfide is first absorbed, and then removed from the absorbing solution by activation with air. This air, containing the hydrogen sulfide, is either discharged into the atmosphere or utilized through combustion in boilers, gas producers, or coke ovens. Later modifications were made in the process whereby sulfur could be recovered from the hydrogen sulfide.

ACCORDING to press reports Colonel Charles A. Lindbergh, technical adviser to the Pan-American Airways System, may take charge of survey flying in Greenland and Iceland this summer. Juan T. Trippe, president of the system, states that an expedition would carry on further studies of the northern transatlantic flying route. If it is possible for him to be away, Colonel Lindbergh may later join the expedition by plane. A chartered vessel, the *S. S. Jelling,* of 3,500 tons, will carry a technical staff headed by Major Robert A. Logan, of the airline, to Labrador and Greenland. It will have on board equipment for meteorological study, including an airplane. The vessel will also serve as a base for the expedition. The expedition aims to supplement the data on the route already assembled. The work is being carried on in association with European international airlines, including Imperial Airways and the French Aéropostale. It is planned that an airplane, flying from New York, shall join the expedition later in the summer to carry out special surveys and photographic work.

DISCUSSION

A GRAND MASTER KEY TO BIOLOGICAL LITERATURE

BIOLOGY long since has grown to unwieldy proportions and has split into several groups of more workable size and presumably of greater community of interest. These groups in turn have undergone or are undergoing a disintegration. At Atlantic City, for example, was held the first annual meeting of the Genetics Society of America with a program of 45 papers. A new Mycological Society of America emerged at the same time. Under the four headings of Agriculture, Botany, Medical Sciences and Zoology, 19 organizations held meetings at Atlantic City and in most of them simultaneous sessions were held to dispose of the mass of papers offered. Furthermore, the Atlantic City meeting was not one of the "big" meetings, and many societies met elsewhere. Truly biology has spawned a diversified progeny and the end is not yet.

Some of the new organizations indicate clearly the need for realignments—the old cleavage lines are now unnatural. This was recognized 18 years ago by the Ecologists and more than a year ago by the Geneticists. In other cases the need is extant, witness simultaneous sessions dealing with virus diseases in the Medical Sciences and in the Phytopathological Society, not to mention papers in three different societies dealing with problems of immunity.

The literature of biology is a relatively permanent thing. It will be extant long after the scientist and his presentation at the "annual meeting" are gone and all but forgotten. This literature unfortunately appears in a much greater variety of places than the fairly large number of societies would indicate, even after multiplying that number by the number of nations in which scholarly work is being done. In fact, over 5,000 serial publications are examined for biological publications by the corps of workers of *Biological Abstracts*. Little wonder that a worker in some narrow field of biology hesitates to comment on biology in general, or on work in some other cubicle of the science. For some of these cubicles workable keys to the literature exist, but for some others there is no key or the keys have become rusty or are either temporarily misplaced or perhaps lost. Biologists have not been unmindful of the confusion that exists and for several years past have been trying to do something to improve the situation. The monthly accretions of *Biological Abstracts* only serve to intensify and emphasize the necessity for a grand master key. Most fortunately it now appears that the key is going to be available to any one who wishes it. Dr. McClung's modest announcement in SCIENCE of May 27, 1932, indicated that support had been found for the publication of indexes, and the appearance of the index for volume 2 of *Biological Abstracts* in December with the promise of an index for volume 3 within a few months is tangible evidence that this most important need of biology is going to be met.

Ordinarily an index volume can be inserted at its proper place in a file to be examined when needed. A volume which is to form a part of the grand master key to recent biological literature is worth examining most critically. Is it really going to work? The undersigned, of course, can apply the test only in a limited way, but it is easy to see that the index to the biological literature of the year 1928 makes a volume of nearly 500 pages, pages the same size as the one on which these words are printed, six point type, the first quarter with four columns to the page and the remaining three quarters with three columns to the page. Truly, there are a large number of references here, an almost unbelievably large number, but in the very first line the consultant is reminded that "this volume covers only a part of the literature published in the period during which the volume was issued. Succeeding volumes . . . must be consulted. . . ." As one reads on for four pages it becomes evident that the compilers of the volume are biologists, that they speak in terms readily understood by their coworkers, that the problems of making a useful index have been studied most carefully. Upon glancing through the four pages of "introductory guide to the indexes" it becomes apparent that they are pages to be read again. One needs to understand exactly what is said here in order to appreciate how ambitious is the pretension of these index makers. It sounds almost too good to be true. Even the mechanics of construction and composition of such a table will arouse the curiosity of the editorially minded.

But the proof of the genuineness of this master key lies in the actual tests. Does it actually turn the lock of this cubicle and that? The writer has made some tests in a field with which he is familiar. Of course, an author index is largely a matter of alphabet, but in this index each joint or junior author rates a full entry with his name in boldface type. The most notable thing about the subject index is the fact that the words in common usage by workers appear there in proper alphabetic sequence. There is no necessity to speculate about the system of logic employed by the compilers. Generous use is made of "see also" and "see under." The Systematist doubtless will be pleased with the separate systematic index, but this index is also made useful to those who are only mildly concerned with systematics. Each generic name in the subject index is set in italics and is followed by a reference to the systematic index. By turning to the systematic index one is able to orient himself quickly, and he can find there the names of organisms in closely related genera. Furthermore, there is a geographical index and a geological index to paleontological material. By a judicious and intelligent use of the whole index it is possible to cull out from the index alone the papers that might have interest. The abstracts may be consulted then to find out more about the original papers.

It is to be noted that the subject index is based upon an analysis of the abstract and not merely the title. The master key goes no farther than the abstract, but there is increasing evidence that the title "grand master key" is about to be justified. The number of abstracts prepared by the authors themselves appears to be increasing from volume to volume and what is even more important the quality of the abstract is positively improving. Collaborators are learning by experience how to prepare the most useful kind of abstract. In one test case pursued by the writer it was found that an author abstract was actually more useful than the original paper. The original is a long, intricate account of experiments and deductions. The abstract is a short concise statement of results prepared by an author in whose accuracy and integrity a personal acquaintance, at least, places absolute confidence. This suggests, incidentally, that if a limitation of space had been imposed by the editor of the research journal a more

readable original might have resulted. Biologists generally are most assuredly under great obligation to the editors who are constructing this grand master key to our literature, and especially are they indebted to the Rockefeller Foundation, which through its support is making this fine work possible. It is indeed encouraging that a great foundation recognizes the fundamental importance of such instruments in the progress of science, especially with the increasing complexity of the literature, and is facilitating their development through a broad program of support. Few opportunities present themselves where limited funds accomplish so much for the general welfare of the science.

DONALD REDDICK

CORNELL UNIVERSITY

SWARMING AND MATING OF ANTS

VARIOUS kinds of ants are present on lawns in Columbia, Missouri, including large black and brown forms measuring about 1 cm in length and the smaller ones 2 to 5 mm. For 30 years it has been observed that they swarm between August 15 and 20 each year, the average date being near the 20th. This usually takes place about 4 o'clock in the afternoon and it has frequently happened that the swarming has occurred following rain the previous night or forenoon. All varieties swarm at this time, and the start, heralded by the expulsion of the queens to the surface of the ground, is remarkably simultaneous between the different colonies. Once started, within the space of a few minutes, the surface of the ground for a foot or more surrounding the comparatively inconspicuous nest, as judged by the entrance or chimney, is occupied by scores or hundreds of queens, each queen being in charge of several workers who groom her for her flight. Intermingled with the queens and workers are many male ants nervously darting about. Soon after the first queens are expelled from the chimney by workers pushing and pulling—the grooming process is completed and she takes wing. Likewise the male ants take wing. At varying distances the queens alight, as do also the males, but no individual queen is followed by males. After alighting the queen mounts some object as a blade of grass where she is found by a male and the mating process is accomplished in a minute or two and the male departs. After a short interval of quiescence the female becomes nervously active and in a minute or two while clinging to a blade of grass or similar object—by means of her legs she detaches her wings. Immediately she descends to the ground and rapidly searches for a place to begin burrowing. In the average case this is accomplished in a very short time and she starts a tunnel for a new colony. In size the male is much smaller, while the queens are many times larger than the ordinary worker.

Last August while observing a small colony of small brown ants possessing not more than a dozen queens, which had just been removed to the surface and were being groomed for flight, a large black worker ant joined the group—whether by accident or design not being apparent—and instantly a remarkable change in the colony's activities occurred. The queens instantly were seized by several workers and rushed underground, while a mob of other workers attacked the intruder, literally overwhelming it, almost concealing its body. Within less than a minute it was stretched flat with the earth—each appendage, as the limbs, being grasped near the end by an ant which in turn was grasped posteriorly by another ant which in turn was similarly grasped by another ant, so that each limb was stretched by three or more ants which formed radiating lines from the victim's body. Within another minute apparently the victim was dead or rendered harmless, for all but two or three workers abandoned the carcass and retired to the colony, which at this time showed little evidences of activity, the only inhabitants on the surface being the two or three workers engaged in dragging the carcass to the entrance of the colony. The episode was a miniature, but thrilling enactment, with exaggerated ferocity, of Gulliver's experience in Lilliput.

C. C. GUTHRIE

UNIVERSITY OF PITTSBURGH

GOITER PREVENTION WITH FOOD PLANTS GROWN ON IODIZED SOIL

BEAUMONT and Karns[1] have recently published analyses indicating that the iodine content of turnips can be increased by the application of potassium iodide to the soil. "The iodide-treated plants contained 441 and 950 parts per billion of iodine in the roots and tops, respectively, against 165 and 441 parts in chloride-treated plots."

In connection with this "large relative increase in iodine content" the authors raise the question as to "whether these quantities of iodine in food have therapeutic value."

The answer to this question is of considerable practical interest, in view of the well-recognized pathologic changes in the thyroid gland dependent upon a deficiency of iodine in the soil of certain rather extensive regions of the United States sometimes called the "goiter zones."

A significant contribution concerning the prophylactic value of iodide fertilization of the soil is the extensive study carried on by H. Hunziker,[2] in Swit-

[1] A. B. Beaumont and Geo. M. Karns, SCIENCE, 76: 567, 1932.

[2] H. Hunziker, *Schweiz. Woch'schr.*, 45: 2, 1920.